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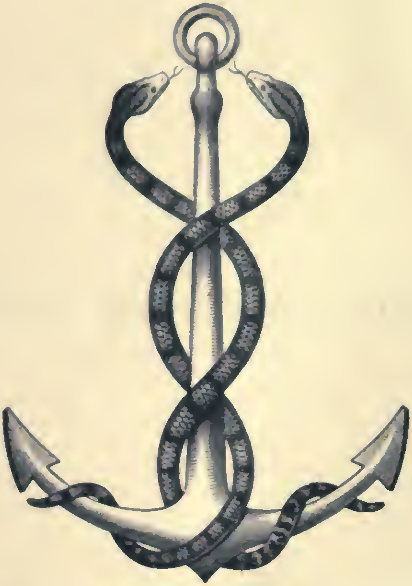

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ORIGINAL COMMUNICATIONS.

THE CLINICAL ASPECTS OF ARTERIAL PRESSURE.

By GEORGE OLIVER, M.D., F.R.C.P.Lond.

IN denominating this series of articles "The Clinical Aspects of Arterial Pressure," I purposely select the term "arterial pressure" in preference to that of "arterial tension," the now generally accepted clinical designation; because, first, every one in these days speaks of the tension of the pulse, while very few can furnish an adequate or definite explanation of what is really meant by the word; secondly, because the degrees of arterial tension (whatever the significance to be attached to the term) can only be indicated in a very general and in a non-comparable way; and, thirdly, because arterial blood pressure, which can be expressed in exact degrees, is the essential or invariable fact common to all those conditions of the cardio-arterial system which are included by every one in the term "arterial tension"—and, moreover, it is a broader fact than is denoted by this expression. In other words, inasmuch as the various degrees of what is clinically known as arterial tension invariably express themselves in terms of blood pressure, which can now be gauged correctly and recorded, why take the roundabout course of descanting on "tension" when the fundamental fact of "pressure" is the main point to be sought for and to be estimated? What is known as arterial tension occupies a smaller clinical province than that of arterial pressure, and in the sequel I will endeavour to outline the limits of both.

Perhaps in this matter our fathers were somewhat wiser than we are in these days of advanced physiology. Just now the term "arterial tension" is in every one's mouth; and I suspect that now and then it is apt to become one of the "idols of the den," and is glibly employed as a sort of paper currency for value in fact, while the sterling coin, which can only be unearthed by patient search, is allowed to pass unnoticed; whereas our fathers in clinical observation relied on the painstaking exercise of the sense of touch, and attained through this avenue of knowledge at least one well-defined position in their study of the pulse in disease, namely, the fact of recognisable differences in resistance to pressure—for they relied on the fundamental distinction between the pulse hard and soft. The conception of arterial tension is quite modern; it was a natural consequent of the birth of our knowledge of the vasomotor system, which opened up a new world to the physiologist in the first instance; and then to the clinician, who has in our day adopted the word "tension" almost as if it were a synonym of "pressure," the tyranny of the new idea having at last dominated over the old.

I therefore propose to revert to the former standpoint of "pressure," from which to study in outline the physiological and clinical conditions that vary it, and to make an attempt to measure it in man with some approximation to the accuracy of manometric observation in the laboratory.

In this article I will describe those methods of recording arterial blood pressure which I have found to be the most trustworthy and accurate; and in subsequent articles I will, in the first place, give an outline of those physiological facts I have observed which have some bearing on the clinical aspects of the variations of arterial blood pressure, and then I will afford a few illustrations of the clinical value of recording that pressure.

The limitations of the sense of touch.—Before describing the instrumental methods of observation, I will glance at the inadequacy of the sense of touch as a means of further advancing our knowledge of this subject. The fingering of the pulse has now gone on for many centuries, with results of unquestionable value to clinical medicine. But the positions attained were merely formulated for practical ends and guidance; they do not constitute knowledge, or at any rate knowledge of the same order as that which has been disclosed in comparatively recent years, by the application of exact methods of observation. While adding to the stock of wisdom, the guiding star in daily clinical work, they did not and could not unfold "the why" and "the wherefore."

The unaided sense of touch is in this respect on a par with that of the eye and the ear; it has its limitations. Many nowadays believe that they excel their predecessors in learning more from the pulse by the aid of the finger; if that be so, it is not because the sense of touch is more efficient than formerly, but because it is now educated to realise in practice much that has been recently acquired as knowledge by other methods of observation, and therefore the finger now sees with the eye of the understanding that which was before obscure and empirical. But notwithstanding all this enlightenment, it is, I think, doubtful if the unaided touch alone can add one more fact to what it has taught us in the past. Moreover, it has, I am persuaded, not only its limitations, which have been long ago reached; it has also, like the other senses, its illusions, which mar even the well-trained finger. I have, for example, repeatedly observed that it is apt to afford the impression of a large artery, because the pulse wave happens to be voluminous under somewhat light pressure, when in reality the vessel is small, and *vice versâ* under the same condition; and it will very frequently indeed furnish a false impression in regard to the blood pressure—under-estimating it as even below normal when it is actually quite high, or suggesting a high blood pressure when in reality it is normal or even somewhat subnormal. From the comparative observations I have made between the capacity of the sense of touch to estimate the arterial pressure and that of the blood pressure gauge, I have no hesitation in saying that the finger, even though well trained, can furnish but very general conclusions.

Though reliance cannot be placed on the finger for the advancement of knowledge, and though it may prove now and then somewhat fallacious in the course of work, it nevertheless remains the most valuable and indispensable instrument the physician possesses for the examination of the pulse; and I am persuaded it is capable of a higher degree of efficiency, when trained by the side of methods which amplify and render more definite all the practical aspects of pulse feeling.

The sphygmograph has likewise served its day, and is no longer likely to reveal anything beyond the many facts it has brought to light, now incorporated in current clinical knowledge. Like a scaffolding, it was necessary to construction. From the clinical standpoint it is of little or no practical value; and even as an instrument of research it fails to record two important facts pertaining to the arterial system, namely, the blood pressure and the varying calibre of the arteries. During the past few years I have endeavoured to study more particularly these aspects of the arterial circulation; and in this series of articles I propose to furnish some of the results of my observations, and preferably those results which have a practical bearing on clinical work.

1. THE HÆMODYNAMOMETER.—*Previous attempts in hæmodynamometry.*—During the past sixty years or more, various instruments have been suggested at home and abroad to indicate the resistance of the pulse, the radial artery having been invariably selected for the purpose.[1] Each instrument had its "little day," and then vanished, to be succeeded by others equally ingenious and ephemeral. History does not, therefore, apparently afford much promise or encouragement for further effort in this direction. But this deceptive conclusion is dispelled, when it is remembered that all these instruments, and especially the earlier ones, merely rendered the pulse visible, and were not standardised on physiological lines.

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[1] See "Pulse Gauging," p. 97.

They were all in the embryonic stage, and not one was developed into a scientific instrument or embodied a scientific principle. They were mere toys, as it were, and as such could only engage the professional mind for the passing moment. None of them were likely to aid the observer in the discovery of new facts, or to prove useful to him in the course of clinical work. On the other hand, the oil sphygmometer of Roy,[1] the clinical sphygmomanometer of v. Basch,[2] and the recently introduced sphygmometer of Hill and Barnard[3] are of quite a different order; they are the outcome of physiological work, and they embody the well-attested principle of the manometer. They are, therefore, scientific instruments. The late Professor Roy's olive oil sphygmometer never, however, advanced beyond the stage of a laboratory experiment, and its construction was ill adapted to clinical work. v. Basch's clinical instrument, though at first rather widely used abroad, has not fulfilled clinical hopes, chiefly because of the feeble and uncertain response to the pulse, and the great uncertainty of knowing when the reading indicative of obliteration of the pulsation should be taken. The principle on which this instrument is constructed, namely, that of fluid pressure, is correct; its clinical inefficiency depends solely on defects in the mechanical details, rendering the reading of the maximum blood pressure uncertain, and that of the mean pressure (which is the most important of the two) impossible. I have worked with the aneroid form of the sphygmometer (with pump and rubber bag to encircle the arm) of Hill and Barnard. Since it appeared, these observers have, however, been led to substitute for it a glass manometer containing coloured fluid, with rubber pad constructed on similar lines to those followed by v. Basch; and I have not as yet had an opportunity of observing the clinical capacities of this recent development.

The blood pressure cannot be correctly determined through a solid medium, only through a fluid one.—This position is well illustrated by my own experience. When, some few years ago, I showed the late Professor Roy a clinical pulse-pressure gauge I had constructed with a solid pad to receive the pulsations of the artery, he remarked:—"I fear that your readings of blood pressure will be vitiated by the varying calibre of the artery in different subjects and in the same subject. I am, however, not quite sure of this; it is a problem which might be referred to a mathematician, as to whether the pressure of a fluid like that of the blood in variable sized tubes can be correctly estimated through the intervention of a solid. I prefer a fluid medium."

I obtained a merely equivocal opinion from the mathematicians on this moot point; and after experimenting with fluid pads, without being able to hit off a satisfactory workable mechanical arrangement, I allowed the solid pad to pass into use. This I regret, because my arteriometer (which measures the calibre of the artery) has conclusively proved to me that the readings of the arterial blood pressure taken by a solid pad are unreliable. This fact led me more and more of late years to neglect my old pulse-pressure gauge; but I have lately been incited by the recent work of Hill and Barnard to improve it by adopting a fluid medium, by following in fact, in this respect, the example of some of the earliest workers in this line, and of some of the later workers, such as v. Basch and Roy. I have at last succeeded in settling all the necessary mechanical details which enable the observer to obtain with accuracy the blood pressure, not only in the arteries, but in the veins; and, moreover, the portability and ease of application of the instrument render it well adapted to clinical work.[1]

---

[1] *Practitioner*, London, vol. xlv.

[2] "Abhandlung ueber den Sphygmomanometer und seine Verwerthung in der Praxis," Berlin, 1887.

[3] *Brit. Med. Journ.*, London, 1897, vol. ii.; *Lancet*, London, 1898, vol. i.

One word more as to the proved misleading determinations of the blood pressure furnished by a solid medium. I suspect that we have in this fact, at least, one reason why the finger is liable to error in estimating differently the same fluid pressure in tubes of different calibres, and consequently why it is apt to go astray in judging of arterial pressure; for the finger is a solid pad. A very little experience with the hæmodynamometer will bring this fact home to the observer who likewise uses the arteriometer; for he will soon find, as a frequent experience, that when the radial calibre becomes constricted in the various pathological conditions to be referred to later on, the mean arterial pressure, as recorded by the blood pressure gauge, will rise, even though the finger may completely fail to perceive the increase, or may even regard the pressure as having fallen. Then, again, it will be observed, as the constriction passes off, that as the calibre of the artery is restored the recorded pressure will fall, whereas it is likely enough that the finger may miss this fact, or may even suggest a rise of pressure. In this way these companion instruments have shown that the daily routine of clinical work is full of interesting experiments in practical physiology, planned by the hand of nature, which the inefficiency of ordinary tactile observation cannot appreciate.

The blood pressure gauge[2] (Fig. 1) consists of two principal parts—(1) the pad and (2) the recorder. *The pad* (Fig. 1, *a*) is made of thin rubber, is small, and of cylindrical shape, and is encircled by a metal rim. The convex lower end of it projects beyond the rim, so that, when it is applied over the vessel, nothing but the soft rubber is brought in contact with the skin. The upper end of it is flat, and is in contact with a solid disc, connected by a stem with the circular spring of the recorder. It is charged with fluid—water brought up to the average specific gravity of serum (1030) by the addition of glycerin.[1] A supplementary pad merely containing air is found useful, under the circumstances to be presently referred to. *The recorder* (Fig. 1, *b*) is a circular box, two inches in diameter, containing a circular spring which receives the pulsations transmitted through the fluid pad. The details of mechanism have been elsewhere described.[2] I have found the circular form of spring adopted, to be permanent in work; and I am persuaded it is superior to the spiral or any other variety. The instrument has been standardised from the mercurial manometer, and corroborative readings have been obtained in the dog.

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[1] It may be convenient to those who have purchased my old pulse-pressure gauge to know that Mr. Hawksley, 357 Oxford Street, London, W., will convert it into the new form with fluid pad.

[2] This instrument was described by me at the meeting of the Physiological Society, held at University College, London, on 12th March 1898.

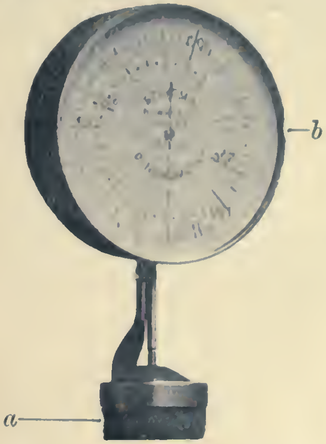

FIG. 1. The hæmodynamometer. *a*, the rubber pad; *b*, the recorder.

How the instrument records the arterial blood pressure.—The pad having been placed over the artery, the observer merely requires to press forward the dial part (the recorder) of the instrument, when the indicator begins to pulsate after denoting a pressure of 50 mm.; and as the pressure is being steadily increased, the pulsations gradually become larger until they attain to a maximum excursion; and then, as the pressure is carried further, they as gradually diminish—the progressive rise and fall of the motion being perfectly equable throughout. The mean arterial blood pressure is indicated when the maximum motion is attained—the reading being made at the point midway between the two limits of the excursion. The maximum arterial pressure is recorded when the pulsation in the artery, beyond the pad, is obliterated. I have elsewhere referred to the clinical bearing of knowing the relationship between the mean and the maximum pressures;[3] and I may again refer to this point.

How the fluid pad determines the arterial pressure. — The principle followed is to equilibrate the fluid pressure within the pad to that within the artery; so that when that point is reached, the two pressures being exactly balanced as it were, and the pad then being but a diverticulum of the artery, the maximum motion of the pulse-wave is developed—this being the visible indication of the perfect continuity of the two fluid pressures, separated merely by membranes, namely, the thin layer of rubber, the skin, subcutaneous tissue, and the arterial wall; a slight reduction, or a slight excess of pressure within the pad, impairing the conduction of all the motory waves of the pulse-beat. Fluid used in this way is therefore a device enabling the observer to obtain a connection with the contents of the arterial system, akin in fact to that of manometric observation in animals, save the breach of tissue.

---

[1] Those who have experience of rubber for medical purposes tell me that immersion in water is the best mode of preserving its properties intact—even for many years. Glycerin is added, with the view of further maintaining the sensitive suppleness of the rubber.

[2] See "Pulse Gauging."

[3] See "Pulse Gauging."

The range of application of the instrument.—It furnishes the blood pressure in any superficial and accessible artery, and in the veins. In the arteries observation may be made on the carotid, temporal, radial, ulnar, posterior-tibial, arteria-dorsalis pedis, or even such small arteries as the arteria-superficialis volæ, or the digital arteries. The radial and the carotid are equally convenient in clinical work. Observation of the venous blood pressure is most conveniently made on the veins on the dorsum of the hand.

The sensitiveness of the instrument in responding to the pulsations.—As a rule, the maximum excursion of the radial pulse is large; being in an average case from 5 to 8 mm., and when the beat is somewhat voluminous, it may attain from 12 to 15 mm. This amplitude of the motion unfolds the character of the pulse—a point of some clinical importance; but, on the other hand, when it exceeds a certain limit, it impairs the exactitude of the reading of the mean pressure, for then it becomes more difficult to determine the point when the maximum development is reached. Whenever the excursions reach this limit, *e.g.* 6 mm., the observer will find it conducive to accuracy of reading, either to substitute the air pad[1] for the fluid one, which reduces the motion to about one-half, or to select a smaller artery, such as the ulnar or its terminal portion in the hand, or the arteria-superficialis volæ, or even one of the digital arteries at the base of the finger. The delicacy of the instrument is shown, not only by affording the blood pressure in the smallest arteries, but in detecting all the degrees of gravity variation in arterial pressure, a difference of 2 or 3 in. in level being, for example, quite apparent.[2] In reading the blood pressure, in any ordinary observation, differences of 5 mm. are quite easily made, and those of 2½ mm. are discriminated without much practice in the use of the instrument.[3]

---

[1] The air pad affords the same readings as the water pad; it merely reduces the motion.

[2] On this account the blood pressure (arterial and venous) should always be taken at the same level from the heart.

[3] It is not necessary to attempt to make finer distinctions than 5 mm. for clinical, or even for physiological purposes. The intermediate markings of 2½ mm. are, however, useful in guiding the eye to discriminate the point when the maximum excursion of the indicator is attained.

The modes of using the instrument for determining arterial pressure.—It may be applied (1) without a rest, (2) on a simple

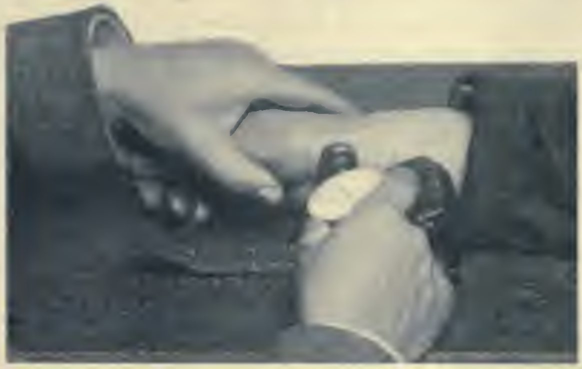

FIG. 2.—Mode of applying the hæmodynamometer to the radial artery on a simple rest (the box which carries the instrument).

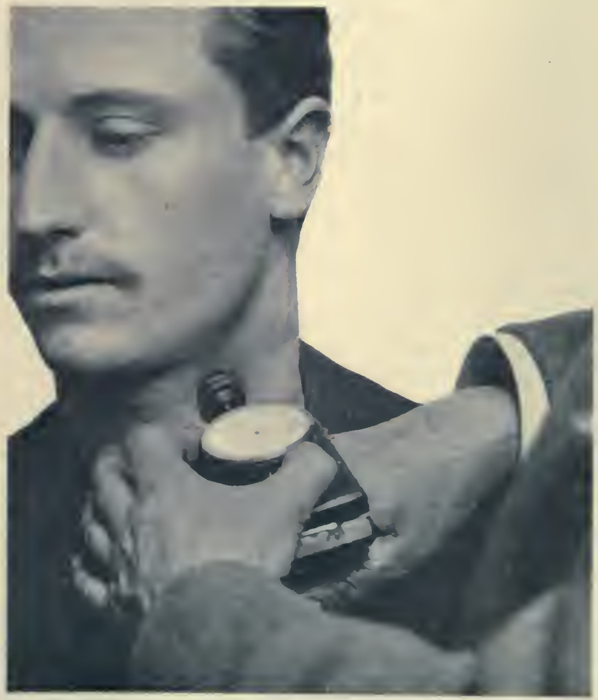

FIG. 3.—Mode of applying the hæmodynamometer to the carotid artery, on the box covering the hand as a rest.

rest, or (3) on a rest with screw adjustment. It can be used easily without any accessory, especially if the observer rests his hand on the table and extends his fingers against an adjacent part of the arm (for the radial), or the clavicle (for the carotid). At the same time, a simple form of rest on which to slide the instrument towards the artery conduces much to accurate and easy observation; the box in which it is carried serves this purpose admirably, the lid being inclined by means of a prop, thus providing a graduated platform for all depths of wrist (Fig. 2), or covering the hand resting on the clavicle and shoulder for observation of

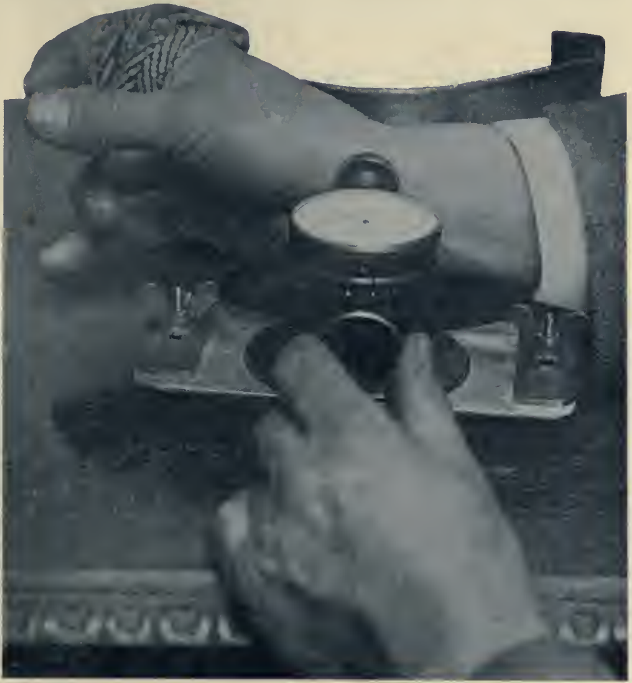

FIG. 4.—Mode of applying the hæmodynamometer to the radial artery on a rest, with screw adjustment.

the carotid pressure (Fig. 3). A still more satisfactory appliance, assuring the greatest possible accuracy in using the instrument in physiological and clinical research, is shown in Figs. 4 and 5. It is an adjustable rest in which the pressure is turned on and off by means of a screw movement. It is used horizontally for determining the blood pressure in the radial or in any of the small arteries of the hand (Fig. 4). The adjustments are easily made, and this arrangement secures a still more ample pulsation of the indicator than can be obtained by the manual application of the instrument; and, moreover, the certainty of reading the maximum point of the excursion is greatly facilitated by the readiness with which the indicator can be made to travel definitely from point to point, backwards and forwards, in the area in which it is obviously to be found.

The mode of determining the venous pressure.—The instrument may be applied by the hand unaided by a rest, or by the screw adjustment just referred to. The hand is placed across the rest (Fig. 5), or on a similar support. A piece of vein, free from tributaries in its course, is selected, and the pad is applied over the distal end of it. The pressure of 10 mm. is then turned on, and the finger is drawn along the vein from the pad upwards. If the pressure suffices to slightly overbalance the intravenous pressure, the vein will remain quite empty, until a somewhat lower pressure of the pad permits the blood from the peripheric tributaries to suddenly fill the vacuum. If, however, the pressure is insufficient, the blue track of venous blood or the fulness of the vein will remain. In that case, further pressure in 2½ or 5 mm. stages is added, until the vein remains empty after the stroke of the finger. The vein would not of course remain collapsed without a valve to prevent the return of blood. Each suitable vein should be tested in turn by the fingers, until one is found that remains empty on

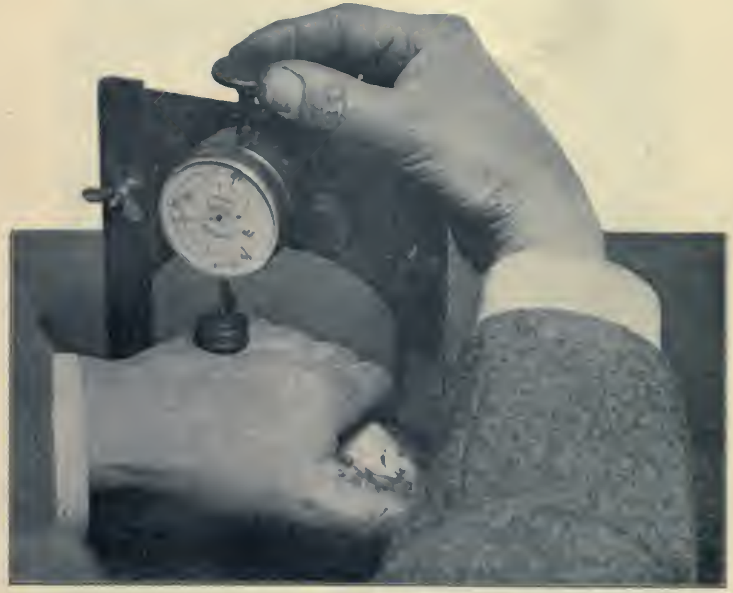

FIG. 5.—Mode of determining the venous pressure with the hæmodynamometer applied by means of a screw adjustment.

blocking the peripheral end, and on drawing a finger over it. If one cannot be found without an efficient valve, the finger must prevent the reflux of blood from the proximal end. Or the observer may adopt the course of at once dispelling the blood by a pressure of 50 or 60 mm., and then allowing it to return by gradually reducing the pressure.

2. The arteriometer.—In the normal condition of the circulation a record of the calibre of the arteries is immaterial; for it is, as a rule, determined by the blood pressure. It is, however, quite otherwise in the pathological field; for there the two facts (calibre and pressure), though often in agreement, are very frequently exactly opposed to each other. It therefore follows that we cannot properly or adequately study the arterial blood pressure without taking the calibre of the arteries into consideration. On this account I must refer to the arteriometer, a portable clinical instrument of the same size as the blood pressure gauge. I have elsewhere described its mechanical construction and the mode of using it.[1]

(*To be continued.*)

THE ARMY MEDICAL STAFF: ITS PAST SERVICES AND ITS PRESENT NEEDS.

By Peter Alexander Young, M.D., *Fellow and Treasurer of the Royal College of Physicians of Edinburgh.*

At the present time there has been much discussion regarding the medical staff of the army, and the difficulty of getting candidates to offer themselves for the examination for commissions in that service.

The main objection seems to be the absence of definite rank and titles. The titles at present in use are so cumbrous that they can only be used in official correspondence, and cannot be employed in ordinary social life; the result being that medical officers, after a long and distinguished career, retiring with say the nominal rank of major-general, are invariably addressed in civil life as plain "Dr." or "Mr."

In the service the supposed rank of the medical officer is set aside, and he is spoken of as simply "the doctor." He is thus deprived of the prestige that military rank confers, he finds himself at a disadvantage when associating with other officers, and he feels that under many circumstances he is snubbed. Although exposing himself equally with other officers to the perils, casualties, and fatigues of campaigns, he has been spoken of in the highest military circles as "a civilian." Can it be wondered at, then, that young men of spirit and talent hesitate before they join a service where they may be subjected to social disability, and cannot enjoy the status that military rank should give?

---

[1] See "Pulse Gauging" and "The Croonian Lectures," *Lancet*, London, June 1896.

It may be of advantage and interest, before further discussing this subject, briefly to look at the evolution of the medical department of our army, and to find if, during the past two hundred years, it has not, by its services to the country, deserved more consideration, and earned for itself a right to be a component and military part of our army. For an account of the chief facts of this historical sketch, I am very largely indebted to Surgeon-Major Albert A. Gore, who, in his work, "Our Services under the Crown," has given a most interesting account of the medical service of our army.

In 1680, the army consisted of but four regiments, and, when Tangiers belonged to Britain, medical officers were sent with the army of occupation. The chirurgeóns were attached to regiments, and their names appeared in the Army List. In the Guards they received 4s. a day, and had a horse to carry their chests. Chirurgeons'-mates were also attached to regiments, but, as they received their warrants from the regimental colonels, their names do not appear in the Army List. The Company of Surgeons of London seems to have provided the chirurgeons and chirurgeons'-mates. About this time the chirurgeons are returned before, and presumably ranking before, captains. During the reign of James II. it was by no means uncommon for medical officers to hold double commissions—purchasing their commissions as ensigns, and obtaining 2s. 6d. a day for extra hospital service. Medical officers who held double commissions were exempted from all combatant duty, such as guard-mounting and attending courts-martial. They ranked as staff officers. In 1685, we have mention of surgeon-general, who occupied the chief position in the Army Medical Service. This officer had, as one of his duties, to certify soldiers who had lost a limb, in order to get a bounty of one year's pay. Sometimes regiments went on board ship to act as marines. When this occurred their surgeons did not go with them, but remained on duty ashore.

In the reign of William III. we find the title of physician-general occurring as the medical head of the army in Ireland. Dr. (afterwards Sir) Patrick Dun was the first to fill this post. For army service he had 10s. a day. Money left by Sir Patrick went partly to found the hospital in Dublin called after him, and which exists to this day, and where soldiers' wives are at present trained to become army midwives. Sir Thomas Molyneux, who afterwards occupied the position of physician-general, was the first medical baronet of Ireland. Thomas Proby, who was chirurgeon-general of the army in Ireland at the end of the seventeenth century, was *ex officio* examiner for the diploma in surgery. In 1697, the Company of Surgeons of London had a bowl of 160 oz. presented to them, "in acknowledgment of their services in examining the surgeons for the army and navy." Marlborough took a great personal interest in the surgeons, with whom he was in constant communication. At Blenheim one in five soldiers was wounded. After Malplaquet 12,706 wounded fell to the allied surgeons. In 1795, Radcliffe attended Lord Albemarle at Namur in camp, and also William III., and received a fee of £1700, and declined a baronetcy. In 1714, the terms surgeon and surgeon's-mate were used instead of chirurgeon. During the reign of George I. a surgeon and surgeon's-mate were attached to the Ordnance Department, which afterwards became the Royal Artillery. During the time of George II. an increase of the army took place, and the regimental staff was arranged thus—chaplain, surgeon, adjutant, quarter-master. In 1743, George II. was present at Hoetch with the army under Lord Stair, and John Ranby, prime sargeant surgeon, was in attendance on the king—the last time a surgeon to the king was present in action. During this campaign it was arranged between Lord Stair and the French commander that the hospitals should be mutually protected, an arrangement strictly observed by both sides. Dr. Francis Horne, afterwards Professor of Materia Medica in the University of Edinburgh, served in Flanders as an army surgeon. Sir John Pringle wrote of the medical arrangements at Dettingen, which were chiefly regimental, with general hospitals in the rear. This surgeon accompanied the army to Scotland during the rebellion of 1745. When the troops advanced on Carlisle the sick were left *en route* in the towns, under civil surgeons and apothecaries. After Culloden, two malt-barns at Inverness received the wounded—broadsword cuts were common, and healed well. Sir John Pringle retired with a baronetcy, and was appointed physician-in-ordinary to the king. In 1716, Sir Hans Sloane was created the first medical baronet in England by George I., and appointed physician-general to the forces. He served in Jamaica on the staff of the Duke of Buckingham. In 1719, he was president of the College of Surgeons, and succeeded Sir Isaac Newton as president of the Royal Society. He was appointed apothecary-general by George II. in 1747, and had the privilege of providing the medicines for the land forces of Great Britain. Properly equipped hospitals were introduced by Middleton, surgeon to the forces, in 1748, patients being provided with separate beds, clean linen, and trained nurses.

Up to 1745, there was no medical inspection of recruits, but after this time rupture was assigned as a disqualifying disability. In 1751, medical officers wore the uniform of the corps to which they belonged. The medical officers of the 39th Foot, in 1757, were the first surgeons of the British Medical Staff who saw service in Bengal.

In 1756 a Hospital Board was formed to control medical affairs, but after a time fell into disuse, and the principal hospital surgeons did the work of the Board.

Oliver Goldsmith obtained a nomination for the East India Company as surgeon's-mate, but failed in his examination at the College of Surgeons. A surgeon's pay in 1760 was £73, while a captain's was £182.

Brocklesby, a distinguished army surgeon, considered that the pay of the army surgeon was too small. He thought that it should at least be £250, as it had to be obtained by purchase, and cost £500. He was of opinion that the medical service should be recruited from young gentlemen, duly qualified, of a good education and liberal turn of mind, with £700 in their pocket to purchase their commissions. He recommended that the examination of candidates should be transferred from Surgeons' Hall to one of the censors of the College of Physicians, conjointly with a physician who knew the proper characteristics requisite in aspirants for the post, it having been the practice, in many instances, for some great man to recommend raw youths just released from their apprenticeship. Brocklesby recommended the use of hut hospitals, which resulted in a lessened mortality amongst sick soldiers.

Donald Monro, a near relation of Monro *primus*, Professor of Anatomy in the University of Edinburgh, was physician to St. George's Hospital and His Majesty's forces in 1761.

Medicine and surgery were considered distinct professions in the army at this period, but a physician or surgeon could hold a regimental appointment. The department was governed in London by a physician-general and a surgeon-general.

The morning visit to a military hospital seems to have been a very perfunctory affair—consisting in calling the roll, and ordering something the patient could not procure from the half-crown a week allowed, which was expended under the direction of the surgeon by the hospital sergeant. The mates did the work, and were frequently warned not to use too much medicine, as it was provided out of the senior officer's annual allowance. Mates were promoted to the rank of surgeon only after a long period of service, and then only by a lucky chance. They were not required to pass an entrance examination. Previous to 1783, surgeons' appointments were bought and sold, but after this period the sale of commissions was legally suppressed, but for long after was still carried on. The officers required simply a certificate from a private teacher to get an appointment; no degree or Surgeons' Hall certificate being necessary. John Hunter, the famous surgeon, said "that it was not necessary for a man to be a surgeon to practise in the army." Promotions were few and far between; surgeons could sell their commissions if they wished to retire, but they had no superannuation allowance. Surgeons to general hospitals received about £200 a year, regimental surgeons £100, and apothecaries 10s. a day.

The physicians of the army, who were highly educated and often University graduates, were looked upon as the *élite* of the profession, and paid very much in advance of regimental surgeons. Occasionally during war a surgeon was raised to the rank of a physician. Surgeons'-mates, although non-commissioned, enjoyed some of the privileges of the surgeons, and had a place assigned to them on parade. The titles master-surgeon, deputy-director, and director of hospitals are first found at this period.

In 1787 we first find the title surgeon-major. The higher titles appeared during a war, when staff surgeons and physicians were selected from civil life on the spur of the expedition, and very rarely from the regimental surgeons.

In 1786, John Hunter was made deputy surgeon-general, and in 1791 appointed to the joint office of surgeon-general and inspector of regimental infirmaries. He had served as senior staff surgeon at Belleisle in 1760, and in Portugal in 1763, when he was designated "surgeon-general, deputy purveyor-inspector, and director of general hospitals." John Hunter made it a rule that the higher ranks should be filled from the lower, but after his death the arrangement that Oxford and Cambridge graduates, or members and licentiates of the College of Physicians should fill the highest grades, was reverted to. After his death, the office of surgeon-general merged into a Board consisting of physician-general, surgeon-general, and one inspector of regimental infirmaries. This arrangement continued till 1808, when it consisted of a director-general and the principal inspectors. After the peace of 1815, these inspectors ceased to be borne on the return of the staff of the army.

Sir Lucas Pepys, who was physician-general and president of the College of Physicians, recommended physicians for the army. The surgeon-general recommended surgeons for the post, and he could delegate his duties to superior surgeons, who were called principal officers of hospitals. The surgeons were placed under the inspector-general. This complicated system was proved inefficient, and led to a new order of inspector-general, appointed from the surgeons of the line, as knowing military duties better. The surgeons provided diet for the sick from a fund allotted for their support—the prices were checked by the commanding officer of the regiment, who signed the surgeon's accounts.

The Duke of York nominated for the office of physician to the forces Dr. Jackson, without the intervention of the College of Physicians, thus breaking the monopoly. Dr. Jackson had served in America and the Peninsula with great distinction. He particularly urged the claim of the medical department of the army to a share of the military honours and distinctions, on the grounds "that it shared in the fatigues and dangers of war, and, in just return, it is entitled to a share of its advantages." He further says: "If a medical officer be professionally skilful and morally correct, he is entitled, as he is eminently useful in his vocation, to a respectful place of rank in the military fabric; the medical officer claims to himself the rank of a gentleman, and the respect which is due to a man of science. Rank is everywhere the gift of power. If the officers of the medical staff were advanced by a just and legitimate rule of gradation, the staff surgeons would class with captains, the physicians with lieutenant-colonels, and the physicians-in-chief with generals. *The rank accorded to the medical officer does not injure or even interfere with the military. Rank is of no intrinsic value to the man of science, but the opinion connected with rank makes an impression on the soldier which aids materially in giving force to medical authority, and consequently to medical utility.*"

Until the termination of the year 1793, the rank of the medical staff of the British army was not distinctly defined. The assistant-surgeon joined a regiment with the rank of lieutenant, and the surgeons took rank with captains, according to date of commission. When staff-surgeons were introduced they did duty in the general hospitals, and were quite distinct from regimental surgeons. Assistant-surgeons followed in rear of the fighting line, and the quarter-master, pioneers, and band removed the wounded to rear, beyond the range of fire. At this time the term Medical Staff was introduced. In 1802, surgeons, called district surgeons, to examine recruits were appointed.

At the beginning of this century, there was some difficulty in getting officers to join the medical staff, and the Dublin School was requested to send officers, and inducements were held out to them to join the service. In 1804, a warrant was issued, granting higher rates of pay. Infantry and cavalry surgeons received 11s. 4d. per diem, and both had to keep a horse. Inspectors and deputy-inspectors of hospitals were nominated in 1805. Sir James M'Grigor, a distinguished graduate of Aberdeen, was one of the first of those appointed. In 1794, he had referred to the difficulty in getting medical officers, and says: "It is not only in the sense of humanity, but in that of sound policy and real economy, that the State should provide able medical and surgical advice for the soldiers when sick or wounded. I look upon it to be an implied part of the compact of the citizens with the State, that whoever enters the service of his country as a soldier, to fight its battles, should be provided with the same quality of medical aid, when sick or wounded, which they enjoyed when a citizen."

1809 As a result of the disaster to the Walcheren Expedition, important changes were made in the constitution of the Army Medical Department. The Army Board was dissolved, and a director-general and principal inspector were appointed. Dr. Weir was the first director-general.

During the Peninsular War, Sir James M'Grigor induced the

Duke of Wellington to mention in the *Gazette* the services of the medical officers. The Duke did this, for the first time in the history of the army. In this war the want of an ambulance with the British army, and of a hospital corps to furnish the means of assisting and conveying the wounded, was very much felt. Sir James M'Grigor was director-general for thirty-five years, and received during his term of office £2000 a year. He had the relative rank of major-general, and retired in 1851. Sir Andrew Smith succeeded, and was called superintendent of the Army Medical Department. He received only £1200 a year. The organisation of the Army Medical Department underwent no material change till the end of the Crimean War. The want of a properly trained corps was much felt, the bandsmen carrying off the wounded on stretchers. They had no special knowledge of how to give first aid to the wounded, and this necessarily increased the work of the medical officers. The department suffered in this general break-down of all the arrangements. Although individually the medical officers behaved well and did their part bravely, yet they were dreadfully hampered by the want of supplies and medical comforts. More than one medical officer took combatant rank, and afterwards commanded his regiment. Assistant-Surgeon Wilson, of the 7th Hussars, "with the greatest gallantry and coolness, assembled a few men of the Guards, and led them to the charge, and utterly routed and dispersed the Russians threatening the Duke of Cambridge's life, whose horse was killed under him. At the close of the day, Mr. Wilson was called to the front of his regiment and publicly thanked for saving, in all probability, the Duke's life."

By the end of the Crimean War, the Medical Department was in a much better state of efficiency than it was at the beginning. A medical staff corps was formed, with distinctive uniform.

A Royal Commission had reported that the weakest point in the Medical Department of the Army was the want of prestige, to give the officers that due importance among their brethren, so essential to the efficient performance of military duties. In a memorial of the medical officers to the Secretary of War, they say: "We submit that we ought to be classed amongst the purely military branches, and reap our share of the honours accorded to them, the exclusion from which, in all campaigns, we deeply feel."

The corporations of Great Britain and Ireland expressed the opinion that—(1) "The existing regulations of the service did not appear to hold out sufficient encouragement, either by present or prospective remuneration and rank, to induce students of the higher order, as to education and attainments, to seek for these appointments"; and (2) "that considering the valuable services which, by universal acknowledgment, were rendered by the medical officers during the late campaign, their self-sacrifice, moral courage, and devotion to their arduous duties, under trying circumstances, the present seems a suitable opportunity for the recognition of the claims of this important branch of the service to higher status and emoluments." The Commission reported: "It is not, however, by money alone that the ablest and most accomplished men will be attracted to the army medical service; the rank, the position, and the honours which are to be obtained constitute, perhaps, the stronger inducements to the higher class of minds."

When the commander-in-chief assumed command in 1855 of the Royal Artillery and Royal Engineers, Sir Andrew Smith became "Director-General of the Army and Ordnance Departments."

After 1858 the titles of medical officers were as follows, namely, Inspector-General of Hospitals; Deputy-Inspector General of Hospitals; Staff or Regimental Surgeon, after twenty years' service Surgeon-Major; and Staff or Regimental Assistant-Surgeon. Mr. Alexander at this time was Director-General. In 1860 took place the first examination for entry into the Army Medical School, which was opened at Fort Pitt, Chatham. In 1878 a committee appointed by Lord Cranbrook reported, amongst other points, in favour of (*a*) giving a new title to the army medical service, such as "Royal Army Surgeons," or "Royal Medical Staff"; (*b*) that the Army Departments should have no precedence *inter se*, but be arranged alphabetically; (*c*) that honours and good service pensions be bestowed on the scale applicable to combatants; (*d*) that the names of the Queen's honorary physicians and surgeons be printed in the *Army List*, immediately after those of Her Majesty's aides-de-camp. They further thought that the medical officers should be associated with the combatant rather than with the administrative services.

X // The regimental system was abolished in 1874. Medical officers now belonged to the Army Medical Department, and were only attached to regiments for duty. They wore a departmental uniform, and no longer the regimental uniform they formerly did. // The reason of this change was mainly that it gave the department more elasticity. When officers belonged to a regiment, under the regimental system, there were usually a surgeon and two assistant-surgeons in each regiment. On active service all these medical officers might not be required with their own regiment, while some other regiments might require more than their complement of medical officers, owing to the regiment being broken up into several detachments, or from some other cause. The medical officers could not be changed from one regiment to another as they were required. Under the departmental system this could be easily effected, as the medical officers did not belong to regiments but were only attached to them, and could at once be sent where required. // At first the departmental uniform was scarlet, while the uniform of the Medical Staff Corps, which was under the command of the medical officers, was blue. /

Gradually the uniform of both officers and men was made the same, and a blue uniform adopted, as it is at the present time.

In 1890 Lord Camperdown's committee recommended that for the title "Medical Staff," which had two or three years before been introduced instead of the "Army Medical Department," the title "Royal Medical Staff" should be adopted, and that compound titles, showing relative army rank, should be introduced. The titles were surgeon-general, surgeon-colonel, surgeon-lieutenant-colonel, surgeon-major, surgeon-captain, and surgeon-lieutenant. This recommendation was not at once agreed to, but a part of it, as far as titles and relative rank are concerned, was introduced afterwards when Mr. Stanhope was War Secretary. The titles used were changed slightly—surgeon major-general being employed instead of surgeon-general, and an additional grade, brigade-surgeon-lieutenant-colonel added.

In the month of April of this year the present Government promised to give medical rank and titles in their own corps, and possibly put the medical staff corps on a footing somewhat similar to that of the Royal Engineers. It is presumed that medical officers will be styled captain or colonel, Medical Staff Corps, or possibly Royal Medical Corps. This latter is doubtful. The cumbrous compound titles will not be used, and medical officers will be called by titles which can be employed in the social circle and civil life, and will be thus placed on an equality with other officers. This is a point that army medical officers have contended for since the introduction of the departmental system. When medical officers were regimental officers the question of rank did not enter acutely into their consideration. If they were pleasant and made themselves agreeable, their position was assured. Being officers of their regiments, they took a great interest in all that concerned its welfare; they were members of the mess, and one of them was often president. Rank was not considered, and the want of titles was not felt. The medical officers of the navy are in that position now; they are officers of the ship, and rank does not come prominently forward. When, however, the Medical Department was formed, and medical officers were only attached to regiments, the want of distinct titles and rank was felt, and medical officers suffered under a disability which was the cause of much discontent. The desire for command outside their own corps has never been expressed—all that was contended for was substantive rank and title, which would convey to the mind of the soldier and the public an exact idea of the position of the officer in the army. The non-commissioned officers of the Medical Staff Corps, when promoted to commissioned rank, are called lieutenants and captains. Officers who have to do with the transport and the commissariat of the army, and who are not nearly so much exposed to the casualties of war as medical officers, have rank and titles.

Even the bandmaster of the Guards ranks as a lieutenant in the army. Why were medical officers alone excluded from this, to which they felt themselves entitled?

The question of courts-martial, mixed boards, and some sanitary boards also required reconsideration. On these, medical officers have no seat, but are requested to attend to give evidence, and have no deliberative vote. The question of pay and pensions is not a burning one. The paucity of numbers renders medical officers liable to frequent changes of station, entailing much expense and great inconvenience. The same cause also leads to the time of service in India being too much prolonged. This further prevents medical officers having study-leave, to enable them at some civil hospital to go through the necessary study to keep themselves abreast of the advances in medicine and surgery. These and other causes, which need not be particularly mentioned here, have prevented men of ability and ambition seeking the medical service of the army as a career, who, under more favourable conditions, might have been attracted to a service which in many ways might be most desirable.

If it be the duty of the Government to arm the soldiers of our army with the best weapons of defence as well as of offence, as every reasonable person will concede, it is surely their duty also to provide the best means of healing the soldier when stricken by disease or wounds in the service of his country, and to have a thoroughly equipped, well trained, and contented medical department.

At the present crisis this can only be obtained by granting the privileges and status indicated in the preceding pages, the more especially when the demands are so moderate, so easily given, and will lead to no increased cost to the country.

Since the above was written, Lord Lansdowne has intimated that the Government intend to grant definite rank and titles to the Medical Department. Medical officers of the army will now be styled Lieutenants, Captains, etc., up to the rank of Colonel. As the rank of General is to be reserved for those having army command, the highest title in the Medical Department will be Surgeon-General, ranking as Major-General. Her Majesty the Queen intends graciously to form the Medical Department into a Royal Corps, under the title of "The Royal Army Medical Corps." These important concessions should now cause the friction between the Government and the Medical Department of the army to cease, and lead to medical men of ability and position joining the army in sufficient numbers to fill all existing vacancies, and if necessary increasing the numbers of medical officers which will be required for the contemplated enlargement of the army.

The medical officers of the army and the profession generally are much indebted to Lord Lansdowne for his courage in making these important changes.

PROLAPSE OF THE MUCOUS MEMBRANE OF THE VERMIFORM APPENDIX INTO THE CÆCUM.

[illegible]

[illegible]

[illegible]

[illegible]

as is usually the case, in the first part of the duodenum, was evidently of some standing, and had, as often occurs, been entirely latent until the fatal perforation. There was much free gas and some grumous fluid in the peritoneal cavity.

The vermiform appendix was considerably curled, and was fixed by old adhesions to the peritoneum below the cæcum; at the point where it joined the cæcum (Fig. 1), there was nothing specially abnormal to notice, and certainly no trace of invagination.

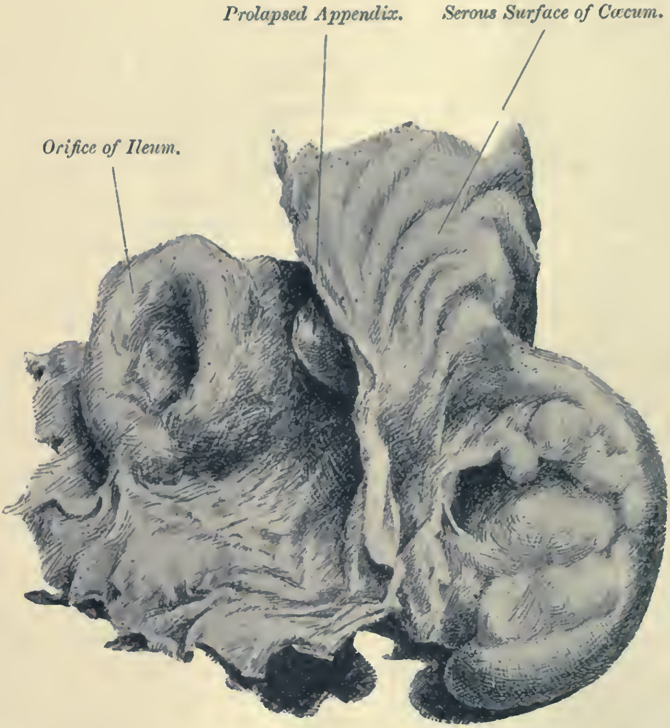

Fig. 1.—Prolapse of the mucous membrane of the appendix into the cæcum. The drawing shows the absence of any invagination of the appendix into the cæcum. The tip of the prolapsed mucous membrane can be seen inside the cæcum.

On opening the cæcum the remarkable appearance seen in Fig. 2 was found. The prolapsed mucosa of the appendix projected stiffly into the cæcum for about half an inch, and was considerably injected, but not ulcerated; it felt firm and hard. As seen later, when a longitudinal section was made, the walls were not thickened, but on the contrary were thin, the distension and firmness being due to the presence of a concretion inside it.

In the middle of the tip of the projecting intracæcal part of the prolapsed mucosa of the appendix there was a small round area, greyish in colour. Soft débris was scraped from the surface, and, when examined fresh under the microscope, showed no evidence of epithelial cells, or granulation tissue, but was composed of crystals and fæcal material. Subsequently a longitudinal section of the appendix proved that this was the tip of the contained concretion, presenting through the lumen of the appendix.

After hardening for two weeks in spirit, a longitudinal section was made, so as to divide in continuity the part of the projection into the cæcum, the adjacent wall of the cæcum, and the proximal part of the appendix (Fig. 3). It was then clear that the appendix had not been invaginated into the large intestine, for the muscular walls of the two could be easily traced, running normally into each other. What had happened was, that the mucous membrane of the proximal part of the appendix had prolapsed into the large intestine. The mucous membrane was

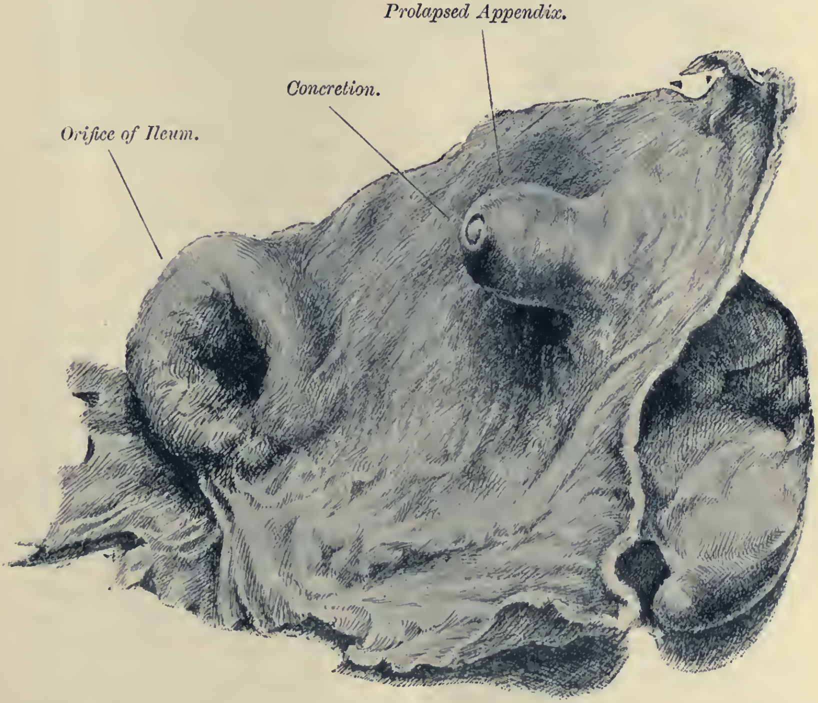

Fig. 2.—Showing the appearances from the inside of the cæcum; the prolapsed mucous membrane of the appendix, with the tip of the concretion, showing through the lumen of the prolapsed mucous membrane of the appendix.

thin, the thickness and size of the projection being due to a concretion enclosed by the prolapsed mucous membrane.

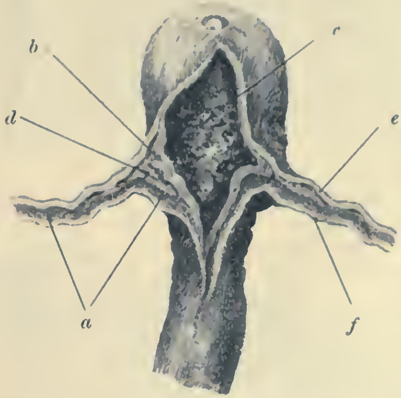

FIG. 3.—Section showing the muscular walls of the appendix (*a*) running normally into those of the cæcum; while the mucous membrane (*b*) of the appendix is prolapsed into the cavity of the cæcum. Cavity inside the prolapsed mucous membrane of the appendix containing a concretion (*c*); separation on submucosa (*d*); mucous coat of cæcum (*e*); peritoneal coat (*f*).

The prolapsed mucous membrane is composed of two layers, one looking into the cæcum, the other lining the dilatation containing the concretion. The latter is very much thinned, and near the tip appears to fade away. As is shown in Mr. Wilson's admirable drawing, the muscular and mucous coats of the appendix part company where the appendix joins the cæcum; the mucous membrane going on to form the prolapsed projection in the cæcum, while the muscular coat passed normally and without any deviation into the wall of the cæcum. Microscopic examination of the prolapsed mucous coat of the appendix showed that the layer looking into the cæcum contained Lieberkühn's crypts, with some lymphoid tissue; under this the muscularis mucosæ and part of the submucous layer, the latter containing fat cells, such as are commonly seen in the submucosa of the cæcum and in the root of the appendix; then some condensed tissue, probably altered muscularis mucosæ; and, forming the lining of the cavity of the prolapsed portion of the appendix, there was inflamed tissue containing remains of the lymphoid tissue of the appendix. No signs of the muscular walls of the appendix were seen in this part.

On cutting open the distal part of the appendix, it was found that the lumen was obliterated for the last $\frac{1}{4}$ in., and that up to the point where it ran through the walls of the cæcum it was much contracted by folding of its mucous membrane.

Mechanism of the prolapse.—The mucous membrane of the appendix had, as a result of the irritation of the fæcal concretion inside it, projected and unfolded itself into the cæcum; this process being probably aided by the contractions of the muscular walls of the appendix.

As an analogous condition, the prolapse of the mucous membrane of the ureters into the bladder, as a result of irritation of a stone, may be quoted. Mr. Hurry Fenwick,[1] at the Royal Medical and Chirurgical Society of London, on 9th November 1897, spoke of this being of frequent occurrence. An extremely well-marked case of prolapse of both ureters into the bladder is figured by Sir Thomas Smith, Bart., in the *Pathological Society's Transactions*, vol. xiv. p. 185. There was a calculus in the right ureter, but not in the left, on which side the prolapse was most marked; and the author did not explain the prolapse as being solely and directly due to the presence of the calculus.

To return to the appendix, this condition is extremely rare, and I have not found any previously recorded case. Now, concretions are fairly common, and it might naturally be asked why prolapse of the mucous membrane does not more often result.

The factors that were present in this case, and which seem of importance as bearing on the production of the prolapse of the mucous membrane, are three—

1. The presence of a source of irritation, a concretion.

2. The fact that the communication of the lumen of the appendix with the cavity of the large intestine was open. This is essential, for, had it been obliterated, it is clear that it would have been impossible for the mucous membrane to unroll itself and prolapse, though intussusception of the vermiform appendix as a whole into the large intestine might occur. In this connection, it would be interesting to know what was the condition of the lumen in the case of intussusception of the appendix. In Renshaw and G. A. Wright's[2] case it was obliterated.

Obliteration of the communication between the appendix and the cæcum is very often met with in appendicitis. Treves[3] says: "Stricture of the appendix plays a prominent part in the production of perityphlitis, and especially in the relapsing form"; while Dieulafoy[4] lays great stress on closure of the lumen of the appendix at some point, with conversion of the more distal portion into a closed cavity, as the cause of appendicitis.

3. The fact that the appendix was adherent to the peritoneum of the iliac fossa, may have assisted in the production of the prolapse, by giving the appendix a *point d'appui* from which to contract, and so drive the concretion towards the colon, and also unroll its mucous membrane. In its ordinary unattached condition it might with some reason be thought that the appendix is not under such favourable conditions as the ureters, which are fixed at both ends.

While favouring prolapse, it seems probable that the fixed position of the appendix would tend to prevent intussusception, by holding the appendix back. The muscular tissue of the appendix is so firmly united to the peritoneum that it would thus be prevented from following the mucous membrane into the colon. The looseness of the submucous coat, on the other hand, would allow separation and prolapse of the mucosa to occur.

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[1] *Med.-Chir. Trans.*, London, 9th November 1897, p. 16.
[2] *Brit. Med. Journ.*, London, 1897, vol. i. p. 1170.
[3] Allbutt's "System of Medicine," vol. ii. p. 888.
[4] *Bull. Acad. de méd.*, Paris, 14th March 1896.

In Renshaw and Wright's case, the appendix was firmly fixed by adhesions, and at first sight this might seem to disprove the suggestion just made. It is, however, expressly stated that the cæcum was extremely movable, being provided with a long mesocæcum, and that the root of the appendix, by its hardness and fixity, probably became the starting-point of the intussusception, just as a polypus or shrunken segment of the bowel may be. It is not perhaps too special pleading to urge that in this instance the movable state of the cæcum played the important part in the production of the invagination.

Though prolapse and intussusception of the appendix are different, it is probable that prolapse may precede and run into invagination, and in B. Pitts'[1] case of complete inversion of the appendix into the cæcum, prolapse and invagination seems to have reached their furthest possible evolution.

Mr. G. Mower White has kindly provided me with the able criticism that, the concretion having formed in the proximal part of the appendix, gradually projected into the cæcum, and thus led to an elevation, the cæcal surface of which is covered by mucous membrane drawn from the cæcum, while the internal lining of the cavity surrounding the concretion belongs to the appendix; and that the orifice of the summit of the projection is the original aperture by which the vermiform appendix communicated with the cæcum. This explanation is different from that given above—*i.e.* prolapse of the mucous membrane—and certainly has the advantage of simplicity in its favour.

For the drawings which illustrate this article, I owe my best thanks to Mr. E. Wilson, B.A. (Cantab.), a senior student of St. George's Hospital.

INFANT FEEDING.[2]

By George Carpenter, M.D. (London), *Senior Physician to Out-patients at The Evelina Hospital for Sick Children, London.*

I need not impress upon you the importance of infant feeding, or apologise for having selected this subject rather than a clinical demonstration on cases of interest in the wards of the hospital. Such sink into insignificance in comparison with the difficult problem I have selected. It is a problem which all of you are called upon daily, almost hourly, to solve, and that being so I venture to think that a practical demonstration on the subject would prove of sufficient interest, and repay you for an omission which my medical and surgical colleagues will fill very worthily. The natural food of an infant is, of course, the mother's milk, and all healthy mothers should feed their infants from the breast. It is one of the greatest privileges of maternity to feed its young from its own body. A healthy mother, who, for the sake of the contour of her chest, or because of the necessarily enforced abstention from gaiety, passes her offspring to the care of strangers for its nourishment, ought to be severely censured. Moreover, nursing is beneficial to the mother; it stimulates her uterus, and is a great preventive of future harm to that organ. But just as it is so desirable that a healthy mother should nurse her offspring, so it is most undesirable that a mother suffering from serious organic disease should attempt to perform that function. I would here mention phthisis and any tuberculous affection of the mammary glands as a contra-indication to nursing. Those in whom there is a strong family history of insanity had better not nurse their children; at any rate nursing should not be carried to such an extent as to undermine the general health. The fact must never be lost sight of that the mind has a great influence for good and evil on the body of the mother, and so on the production of milk. Emotional disturbances of all kinds are most harmful, and may make the milk actually poisonous to the infant. The child should be placed to the breast as soon as the mother has recovered from the fatigue of the labour, say in three or four hours after her confinement. If there is no milk at first, wait for a few hours until it is secreted, placing the child at the breast every three hours.

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[1] *Lancet*, London, 1897, vol. i. p. 1602.

[2] A Lecture delivered to the Post-Graduate Class.

Do not give gruel; a little sugar-water may be given if necessary from time to time. As soon as the milk is secreted apply the child alternately to each breast, even though a preference is shown for one only. The child during the first week should be suckled every two hours, between the hours of 5 A.M. and 11 P.M., and only at fixed intervals. If the child be too weak and puny to take the breast, then it will be necessary to feed it at frequent intervals by teaspoonfuls, using either a sterilised mixture of cream and whey, or a peptonised humanised cow's milk, or a modification of Gaertner's milk, which I will presently mention. Cream and whey mixture is prepared as follows:—

Ordinary cream (20 per cent.) . .	1 fld. oz.
Whey	2 ,,
Sugar of milk	1 drm.

This should be sterilised for half an hour.

The whey is prepared by adding Fairchild's essence of pepsin to fresh milk, which is to be gently warmed. When the milk is set, break up the curd quite small, allow it to settle, and then carefully strain it through several folds of muslin, finally squeezing the contained curd, so as to extract all the moisture.

During the period of nursing several important problems will arise. For instance, should a mother continue to nurse when she again becomes pregnant? Assuming that the mother and child are healthy, the child need not be weaned until the sixth month of pregnancy. Should, however, the double drain on the mother's constitution prove harmful to both of them, shown in the case of the child by gastro-intestinal disturbances, then weaning had better not be delayed. There is also just a possibility that the reflex effect on the uterus may lead to a miscarriage. Should any tendency to such a mishap be discovered, then the child must be fed artificially. Another point for consideration is that menstruation sometimes causes gastro-intestinal disturbance in the infant, said to be due to an increase of proteids in the milk. If this should occur, give the infant a litte boiled water before feeding, and reduce the meat diet of the mother. But there are some mothers who are only capable of partially feeding their offspring. What should be done? The breast milk should be supplemented by Rotch's cream food or Gaertner's humanised milk, which I shall presently discuss, or a modification of cow's milk, previously determined by a chemical analysis of the mother's milk. If analyses of the mother's milk are decided upon, it should be drawn off by the breast pump five minutes after the child has been placed to the breast.

When a mother, from various causes, is quite unable to suckle her child, two courses are open to you, namely, the employment of a wet-nurse, or the use of some modification of cow's milk. Of the alternatives, nothing can compare with a healthy wet-nurse, if her milk is suited to the digestive peculiarities of the infant to be reared. The fact that the wet-nurse should be strong and healthy and free from disease need hardly be dwelt upon, or that a careful medical examination will be necessary before engaging her. She should be between 20 and 30 years of age, and if the foster-child is strong and vigorous a primipara may be selected, but should it be weak and puny, a multipara, as the milk will not be so difficult to digest. If her baby be strong and healthy, this will be a point in her favour. She should not have been recently confined, as the colostrum is undesirable. It will not be a drawback if there is a difference of two or three months between the ages of the children, and in one respect it will be an advantage, as the wet-nurse's child will have shown any symptoms of congenital syphilis by this time, if the disease be present. Of course no syphilitic child can be allowed the advantage of a foster-mother. The treatment of the nursing-mother and the wet-nurse demands your careful attention. A plain mixed diet, with slight excess of fluids and meat above what she has been in the habit of taking, will be found ample. A small quantity of alcohol may be taken, if she has been accustomed to it, otherwise it is unnecessary. Alcohol in small quantities increases the quantity of fat in the milk. Over-feeding and an excessive meat diet will make the milk so rich in proteids as to be quite indigestible. She should take exercise every day, and seize every opportunity of being out in the fresh air. You must not lose sight of the fact that various drugs, some of them of a poisonous nature, pass into the milk, and upset or perhaps even poison the child. Saline purgatives are not desirable, as they are likely to stop the milk. The health of the nursing-woman naturally requires attention, and dyspeptic troubles, or anæmia, will necessitate the appropriate treatment. If a wet-nurse is selected, she must not be allowed to visit her child, but the mother whose child she is nursing must make it her business to see that the child is properly cared for, as an anxious fretting wet-nurse will not produce good milk. No wet-nurse should be allowed to dose her charge, on any pretence whatever. The administration of opium is not unknown. When should the child be weaned? The breasts, as you are aware, begin to fail at various periods of nursing, but no infant should be nursed longer than the first year, even under the most favourable circumstances, as rickets will surely result. When weaning has been decided upon, it should be done by degrees, the artificial food selected gradually taking the place of the breast milk. The process should extend over a period of one month, and at the end of that time the mother should send the child away, or leave it for a few days. Do not wean a child when he is cutting a tooth; avoid if possible the very hot season of the year, for fear of summer diarrhœa; and postpone it if he has just recovered from a severe illness. In the event of a mother being unable to nurse her infant, and in the absence of a wet-nurse, what artificial food can be recommended? There is but one answer to this question, and that is, cow's milk. Chemical analysis of healthy human milk shows that it is composed of the following constituents:—

Fat[1]	4	per cent.
Proteids	1–2	,,
Milk-sugar	7	,,
Salts	0 2	,,
Water	87–88	,,

Cow's milk, on the other hand, is formed as follows:—

Fat	3·75	per cent.
Proteids	3·76	,,
Milk-sugar	4·42	,,
Salts	0·68	,,
Water	87·39	,,

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[1] The percentage of fat, according to Pfeiffer, is 3·1 per cent.; Adriance, 3·8 per cent.; Leeds, 4·1 per cent.; Hoffmann, 4 per cent.

From these tables it will be seen that cow's milk is richer in proteids and salts but poorer in sugar; therefore, in substituting cow's milk for mother's milk, we always dilute with water, to diminish the percentage of proteids, which are so apt to produce indigestion. But in doing this we are diminishing the percentage of fat and making it still poorer in sugar. Hence arises the necessity for adding sugar and cream. But treat cow's milk in whatever way you will it is only a makeshift, and cannot be made to exactly resemble mother's milk chemically; the curd is different, it is not fully digested, it is also lacking in albuminoid, which is present in mother's milk. We must not lose sight of the fact that the milk sold in cities is more often than not stale, that it contains many impurities, and is possibly contaminated with disease germs. Not only is this the case, but many dairy companies use boracic acid or other chemicals to preserve the milk; in other words, that the consumer may be able to obtain it as stale as possible. Boracic acid is often added in such quantity as to make the milk unfit for infant consumption, owing to the indigestion it produces. Apart from such contaminations and adulterations, cow's milk differs enormously in composition, according to the health of the animal, the time it has been in milk, and the quality of the food; hence the advisability of taking the milk from a mixed herd of cattle rather than from one cow, which was once the fashion. The milk of other animals can of course be used, but there is no advantage in this, as their milk will require modification to imitate human milk. Milk, as soon as it is received at the house, should be placed in a clean vessel, filtered through absorbent cotton-wool to remove gross impurities, and then sterilised to free it from the various germs with which it is contaminated. A reliable apparatus for sterilisation is Alt's,[1] which has the merit of being cheap as well as effective. The milk should be sterilised in the separate bottles provided with this apparatus sufficient for the day's consumption, at a temperature of 100° C. for a period of half an hour. After sterilisation the bottles must be kept in a cool place, free from all sources of contamination. Each bottle is to be unsealed and an indiarubber teat affixed, when the baby is about to be fed.

In out-patient hospital practice, as also in the poorer neighbourhoods, we frequently have to rely upon an unsterilised cow's milk, suitably diluted with water, so as to reduce the quantity of the proteids. A mixture of one part milk and two parts sugar-water, the latter of which is made by adding 1 oz. of milk-sugar to a pint of water, approaches human milk in composition, but it is deficient in fat. The deficiency in fat can be remedied by adding 1 drm. of 20 per cent. cream to every ounce of the milk mixture, and failing this $\frac{1}{3}$ of the quantity of cream, in the shape of cod-liver oil, should be given to the child. This mixture should be boiled for half an hour, and when it is cool a $\frac{1}{20}$ part of lime-water added to it makes the fluid slightly alkaline. Ordinary sugar may be used instead of milk-sugar, if the proper proportion is observed. In private practice Rotch's cream mixture will be found reliable and very satisfactory. It is a near approach to human milk in chemical composition. For its preparation the ingredients are to be mixed, as soon as they are received from the dairyman, in the following proportions:—

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[1] This can be procured from Dr. Schack-Sommer, Woburn House, Woburn Place, London, W.C.

Cream (20 per cent.)	$1\frac{1}{2}$ fluid oz.
Milk	1 ,,
Water	5 ,,
Lime-water[1]	$\frac{1}{2}$,,
Milk-sugar	$3\frac{3}{8}$ drms.

I will now call your attention to the method of preparation of Gaertner's humanised milk. The fresh milk mixed with an equal quantity of boiling water is placed in the centrifugal apparatus, the Victoria cream separator. The machine is revolved at such a speed that the outcoming streams become equal. From one spout pours all the cream and half the milk and water, and from the other spout the remainder. The dirt remains in the machine. All the fat is thus obtained, half the proteids, half the milk-sugar, and half the salts. To bring the sugar to the required standard, $5\frac{7}{10}$ drms. of milk-sugar are added to every pint of this mixture before bottling. It is then sterilised in the bottles, which contain the milk ready for consumption. Should half the original proteids be still too large for the digestive capabilities, the mixture, before the sugar is added, can once more be diluted with boiling water and again sent through the centrifugal cream separator, thus obtaining all the fat, one-fourth of the original proteids, salts, and milk-sugar. In that case a larger quantity of milk-sugar will have to be added, if the human milk standard is desired. The percentage of fat in the Gaertner milk is always kept at from 3·2 per cent. to 3·5 per cent. The casein of this milk, when it is precipitated by the gastric juice, curdles in a flocculent form in the same way as does mother's milk, and not like indiarubber, as is the case with cow's milk. I have made arrangements with the Friern Manor Dairy Co., of 20 Farringdon Street, E.C., who are responsible for the process in London, to dispense a sterilised milk mixture of any desired chemical formula, on receipt of a doctor's prescription. The great importance of this will be readily recognised. It will enable you to feed your infant patients with an approach to scientific precision which has been hitherto unknown in this country. By means of this you can readily vary the quality of the food, according to the digestive capabilities of the child. If you find that the proteids supplied in the humanised milk are still in too great abundance, and induce gastro-intestinal disturbance, all that will be necessary for you to do will be to send your prescription to the office, instructing them that your requirements are, say, 0·5 per cent., or 0·75 per cent., or 1 per cent. of proteids, or any other percentage you may select, in your milk mixture. In the same way you can regulate the quantity of fat in the shape of cream; in fact, select any percentage that may appear desirable should diarrhœa or vomiting from an excess of fat prove troublesome. On the other hand, if the fat supplied be insufficient for the requirements of your patient, for a deficiency of fat leads to anæmia and constipation, then you will be able to increase the quantity. The quantity of milk-sugar can also be regulated as required.

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[1] The lime-water is to be added after sterilisation.

It has hitherto been the custom in cases of summer diarrhœa to withhold all milk and feed temporarily on albumin water, but Rotch, who was the pioneer of the Walker-Gordon milk establishments of the leading American cities, has found that if the fat is reduced to 1·5 per cent., the proteids to 0·25 to 0·75 per cent., and the sugar to 4 to 5 per cent., the milk agrees very well. For prematurely born infants the Gaertner milk can readily be adapted to their digestive capacities by reducing the proteids to 0·5 per cent., or perhaps a trifle less. The Friern Manor Dairy Co., at my request, have consented to supply all the metropolitan hospitals, both out-patients and in-patients, with milk at cost price, on receipt of a physician's order; and doubtless they will be prepared to do the same with your patients, should you deem the case worthy of such assistance.

Before leaving this subject, let me tell you that the Gaertner milk is not sterilised to last indefinitely—it should not be kept for a long time. Full sterilisation makes the milk brown from caramelisation of the sugar; and changes take place in the fat and sugar, which make them indigestible. Further sterilisation does not destroy germs with absolute certainty, any bacteria that may be left are not necessarily harmless, and proliferating bacteria cannot always be recognised by signs of decomposition. Therefore, sterilised milk should not be kept for too long a period, but should be consumed as soon after sterilisation as possible. Sterilisation appears to rob milk of its antiscorbutic properties, therefore infants who are being fed upon it require careful watching, and any suspicion of the advent of scurvy must be combated by the ingestion of orange juice. The Walker-Gordon laboratories do not sterilise their milk unless compelled, the distances to be travelled determining this. They rely on ice for its preservation for twenty-four hours. There are several other humanised milks on the market, the oldest and best-known preparations being those of the Aylesbury Dairy Co., whose milks, I have no doubt, you have frequently used in your practice. Lloyd, in the *Dairy* of 15th March 1897, calls attention to some samples of humanised milk. In one sample the fat was 1·1 per cent., in another 5·2 per cent., and the sugar 3·5 per cent.; and he calls attention to even worse samples than these, one containing over 10 per cent. of sugar.

The question must frequently present itself to you as to whether barley-water, or oatmeal-water, or rice-water should be added to milk. These waters certainly have nutrient worth, and cause the curd to split up into finer particles, and thus render it more easy of digestion. If eczema is induced by the use of these, gelatin jelly may be substituted. Barley-water may be added to Rotch's cream mixture, instead of plain water, if necessary. Prepare it as follows:—Take two teaspoonfuls of Robinson's patent barley and place in a clean jug. Pour on it a pint of boiling water, stand by the fire for an hour, stir frequently, and add a pinch of salt. The same quantity of oatmeal or ground rice can be used in place of the barley. These waters should be sterilised with the milk to which they are added. Should milk be partially or wholly peptonised? As a temporary measure peptonisation of milk is beneficial. It should be reserved for cases where there is troublesome sickness, or diarrhœa, or the digestive powers are exceedingly weak, and then only to tide the infant over its illness. If it is persisted in, the infant's gastro-intestinal glands will not develop properly, and the seeds of dyspeptic troubles in after life may be sown in infancy.

This question also must frequently present itself to your minds, "What can be urged in favour of the use of condensed milk?" It does not "turn" quickly, the curd is digested better because it is not so thick, and it is convenient when travelling. The best brands are "The Milkmaid" and "The Viking," but to bring them up to the human milk standard it will be necessary to add 1 drm. of sterilised 20 per cent. cream to every fluid ounce of these when mixed with water. The former also requires 1 drm. of milk-sugar to every 1½ fluid oz. when mixed with water, and 1 drm. to every ½ fluid oz. of the latter when so mixed. In both cases there is a loss of phosphate of lime salts. It has recently been ascertained that Swiss cows are tuberculous to a far greater extent than the cows of any other country, namely, 85 per cent. of all the cows. Swiss milk is, as you are doubtless aware, evaporated *in vacuo* and therefore not sterilised, consequently the tubercle bacilli are not destroyed. There are several dried milk foods on the market, and I now present for your inspection those of Messrs. Allen & Hanbury. Dried milk foods are small in bulk, and their proteids are digested with greater ease. They are said to be sterile. No. 1 is a human milk imitation prepared from cow's milk. It is called "The First Food for Infants," and is recommended to be used during the first three months. No. 2, called "The Mother's Milk Food," stated to be for use from 3 to 7 months of age, is prepared in the same way, but contains in addition soluble starch derivatives and sugar, also albuminoids and salts extracted from whole wheat-meal and barley-meal. I pass round for your inspection Nos. 1 and 2, and also the solutions made from these according to the directions. Should either of these preparations agree, the addition of fat may be found desirable and advisable in the shape of ordinary 20 per cent. sterilised cream, 6 drms. to every 6 oz. of the fluid, when prepared as directed, of either No. 1 or No. 2.

Mr. C. Drenckhan, of Stendorf, Germany, also succeeded in making what was apparently a perfect dried milk food. The German navy patronised it, also private shipowners, but unfortunately it would not keep, as the albuminoids decomposed and the fat went rancid. No preservative had been added, and it would appear from this that some chemical preservative is necessary to prevent decomposition in dried milk foods. Of course, as long as they are kept dry, germs cannot multiply in them. Whilst discussing all these methods of infant feeding now in vogue, the scientific advantages to be obtained by the use of Gaertner's milk, or rather the modifications of the process I have related, must be sufficiently obvious to you, and I need hardly, therefore, advise you to adopt this process in preference to any other I have mentioned. Any system in this country which will give us equal facilities to our American confrères, and enable the medical profession to supervise and control its infant dietetics, should be welcomed, and the advent of the Walker-Gordon laboratories in Great Britain would prove a positive boon. Such a system permits you to become responsible for the prescribing and ordering of the diet, and not the advertising baby-food manufacturers, who dictate to you in the most barefaced way as to the manner in which an infant should be fed. The alert foodmonger has too long held undisputed sway in the nursery, and it is high time that the bulk of the medical profession in England should wake up and relieve itself of what is a great opprobium in the eyes of more advanced nations in this respect, and for which, from the generally lethargic attitude it adopts regarding infant feeding, it is certainly responsible. It can only do so by taking an interest in this difficult subject, and by being able to control at will the quantities of the important constituents of the milk which are known to prove a source of trouble in infant feeding. The gain to the infant world will be immense, the huge infant mortality will not be a crying disgrace as it is at present, and the value of the knowledge to be gained by the medical profession, working in unison on scientific principles, cannot be over-estimated. The next question for our consideration is, "How often should the infant be fed, and what quantities of food should be given at each feeding?" The quantity must be determined by the age, the weight, and the digestive powers of the infant. For the average infant the following table will be found a useful guide:—

	Intervals of Feeding.	Number in Twenty-four Hours.	Average Amt. each Feeding.	Average in Twenty-four Hours.
First week . . .	2 hrs.	10	1 oz.	10 oz.
First month . . .	2½ ,,	8	1½–2 ,,	12–16 ,,
Second month . .	2½ ,,	8	3–4 ,,	20–30 ,,
Third and fourth months	3 ,,	7	4–5 ,,	30–35 ,,
Fifth and sixth ,,	3 ,,	6	6–7 ,,	35–40 ,,

The quantity of milk administered within these specified limits will depend upon the constitutional peculiarities of the infant, and upon the previously mentioned factors, but the maximum amounts here advised should not be exceeded. The hours of feeding should be between 5 A.M. and 11 P.M., and punctually observed; if they are faithfully adhered to, the child will wake crying at the regular times appointed for its meals.

A word about feeding-bottles, an assortment of which, along with various rubber teats, I have just received from Paris. The bottles supplied with Alt's steriliser can be recommended, and the soft rubber teats accompanying them can be readily turned inside out and thoroughly cleaned. When cutting these do not make the orifices too small, or the infant will not be able to suck properly, and if too large it will bolt its food, and the inevitable will follow. The old boat-shaped bottle is good, and that supplied by Allen & Hanbury can also be recommended. Feeding-bottles of this class compel the feeding of the infant by the nurse, the tendency to food-bolting is controlled, and the disgusting habit of placing the bottle in the cot with the child is prevented. It is hardly necessary to insist upon chemical cleanliness; therefore the use of bottles with internal indentations, or those provided with tubes, must be strongly condemned.

At the commencement of the seventh month, if the infant is still thriving, the modified cow's milk which has been found suited to it should be still continued, the child taking from 35 to 40 oz. in the twenty-four hours, and there need be no change of diet until it is 10 or 12 months old. It should be fed every three hours, the average amount at each feeding being 8 oz., namely, at 8 A.M., 11 A.M., 2 P.M., 5 P.M., and 11 P.M.

The digestive powers are now quite able to deal with well-cooked starchy foods, if not given in too great abundance. Should the growth of the muscles, the bones, and the teeth prove slow, and the skull bones become softened, then it will be advisable to add cereals to the modified cow's milk. During the seventh, eighth, and ninth months, the weekly gain in weight should be from 3 to 3½ oz., and during the tenth, eleventh, and twelfth months, from 1½ to 2 oz. Increase in weight must not be looked upon as a certain guide, because, as you are aware, rachitic children are often fat and clumsy. Any of the cereals may be given, namely, oats, rice, barley, wheat, or maize. The grains should be washed, then ground into a fine powder in a coffee-mill, and finally passed through a No. 80 sieve. Two tablespoonfuls of the meal to a pint of milk will make a suitable mixture. Great care must be exercised in the preparation of the food which, when thoroughly cooked for twenty minutes in a clean enamelled saucepan, should be placed in the separate bottles of the steriliser; and after sterilisation removed to a cool place, from which it can be fetched as required. Should the starch prove troublesome to digest at first, it may be partially predigested by using an artificially prepared ferment, such as Diastol, manufactured by the Standard Malt Extract Co., which is a reliable preparation. This naturally leads us, in conclusion, to the offering of a few remarks on the subject of the various patent infant foods, whose acquaintance you have doubtless made before in many households. Here, on the table, you will see the names of the best-known foods, together with the most prominent features of their composition. When they should be used, when they should not be used, or whether they should be used under any circumstances, will be apparent to you from the remarks I have previously made on the subject of infant dietetics.

Names of Foods.	Most Prominent Features of their Composition.
Neave's, Ridge's, and Frame food	Starch (unaltered).
Nestle's, Anglo-Swiss, American-Swiss, and Franco-Swiss	Starch, cane-sugar, and milk. When suitably diluted, fat and albuminoids small in quantity.
Carnrick	Starch, sugar, cow's milk, and an animal digestant. When suitably diluted, fat and albuminoids small in quantity.
Mellin.	Sugar and soluble starch derivatives. When mixed with milk, as directed, the fat is deficient, and the albuminoids are more than advisable.
Benger	Starch, sugar, soluble starch derivatives, and an animal digestant. When mixed with cow's milk there is an insufficiency of fat.
Horlick's malted food . . .	Dry powder. Human milk imitation. Soluble starch derivatives and an animal digestant. When mixed with water very deficient in fat.

The time at our disposal has unfortunately been short, and the importance and extent of the subject out of all proportion to such a time restriction. Much has been omitted that might have been mentioned, and much only rapidly passed in review which merited greater attention. In spite, however, of the shortcomings, I hope that what I have brought to your notice will prove of assistance to you in your practice.

ON DEFECTIVE ARTICULATION OF THE CONSONANT *R*.

By JOHN BENJAMIN HELLIER, M.D. (Lond.), M.R.C.S., *Lecturer on Diseases of Women and Children, Yorkshire College; Surgeon, Hospital for Women and Children, Leeds.*

ONCE in the days of old at the fords of Jordan each passer-by was called upon to articulate for his life; and if he could not "frame to pronounce aright" *Shibboleth,* immediate slaughter overtook him. If a similar ordeal were imposed upon the English-speaking race to-day, and if the test-word were selected from their mother-tongue, what one would prove the most fatal? It would certainly be the word "orrery" or "arrowroot," or some other word containing a double *r*-trill. The most widespread and one of the most incurable of the defects of articulation is an inability to rightly pronounce the consonant *r*. He would be a very careless observer who should ascribe this particular defect to mere affectation or indolence, or should consider it the exclusive characteristic of persons of the Lord Dundreary type, who hold that "energy is weally howwid bad form." On the contrary, this inability to articulate is so complete in many persons, that it is doubtful if they could suddenly overcome it if life itself were at stake. There is reason to think that the defect may be hereditarily transmitted. Certainly it has often been unsuccessfully struggled against for a lifetime.

It is surprising that medical literature, so far as we have been able to discover, contains so little that is of value on the subject, and that attempts to treat the affection systematically seem to have been so seldom undertaken. The contrast is marked between this subject and that of stammering, the literature of which is voluminous if not redundant. There can be no doubt that our knowledge of the treatment of the defective *r* is at present very unsatisfactory. It may not be difficult to meet with some *soi-disant* professor of elocution, who will profess ability to cure it, but the very confidence with which he promises cure is his condemnation. When the difficulty is honestly faced by writers on the subject, very scant encouragement is given to the sufferer. Bristowe, who has given attention to the question, states that he has never had the good fortune to effect a perfect cure;[1] and one of the greatest authorities on all points connected with language remarks, to the discouragement of many, that he is himself unable to pronounce the different *r's*.[2] The author of this paper has for many years struggled with the same difficulty, and can lay claim to only very partial victory. He writes this paper, first, because he has at least one special qualification for the task, namely, personal experience of the difficulty in question. Secondly, because he is anxious to ask for this subject a fuller consideration by the medical and the educational professions than has yet been given. Thirdly, because it seems to him that it is impossible to over-estimate the importance of the early recognition and treatment, not only of this, but of all speech defects in childhood, if they are to be cured at all. Lastly, he ventures to suggest provisionally a system of treatment for defective *r*-articulation.

He has no statistics of the frequency of this defect in England, but the number of those who are personally interested in the question is considerable. Most who read this will be able to reckon instances amongst their acquaintances.

The letter *r* may be produced at the tip of the tongue, at the back of the tongue, or with the lips.

The first is the "lingual" *r*. It is the ordinary English *r*, as heard in "rest" or "error."

The "guttural" *r*, in which the soft palate and uvula are thrown into vibration, should not occur in speaking English. The substitution of the guttural for the lingual *r* constitutes a well-known defect of speech, called by various names, such as, "rhotacismus," "burring," etc., and the term *grasseyement* is also applied to it by certain authors. The "labial" *r* is not found in any European language. It is closely allied to the sound which coachmen make to their horses.

There is another *r* sound, which is called *r*-vocal. This is heard in "far, cur, war, arm, world," etc. This is more a vowel than a consonant, and presents no difficulty to an Englishman. The only defect of speech with which it is associated consists in its introduction in wrong places, as in "idear" for "idea," and "mar" for "ma." So Thackeray's cockney policeman sings—

"And there he sor
These men of Lor," etc.

It is the lingual *r*, which might be more exactly designated the "tongue-tip" *r*, which presents the difficulty under consideration.

The manner in which this *r* is produced is usually said to be as follows. It is caused by vibration of the tip of the tongue. The jaws are approximated till the incisor teeth almost touch. The tongue advances in the mouth till the tip is applied to the palate just behind the upper incisor teeth, the under surface of the tongue-tip resting against the back of the teeth. A stream of air is driven forwards over the tongue, and the tip is thrown into vibration, and thus at the end of the tongue the pure lingual *r* is formed. This description was given by Fournier in 1817.[1] It has been stated that the vibration is effected, not in the centre of the tongue-tip, but usually on the right side of the middle line.[2]

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[1] "The Book of Health," London.

[2] Max Müller, "Science of Language," Ser. 2.

So Foster, "Text Book of Physiology," says: "The ordinary *r* is produced by the vibration of the point of the tongue elevated against the hard palate." But, on the other hand, Bristowe, "Pathological Relations of Voice and Speech," says that the ordinary English *r* presents two varieties, the *r* as heard in the word "rest, and the *r* of "error," "arrow," etc.; that the *r* of "error" is a trilled *r*, and is produced by vibrations of the tongue-tip, but that the *r* of "rest" is untrilled, and is produced as follows:—

The tongue is arched in such a manner that its upper surface is rendered concave from before backwards, while its tip, which is a little reverted, points to the highest part of the palatal arch. The sound of the letter is due to the passage of the breath through the narrow aperture which is left between the tip of the tongue and the palate, but in no degree, as in the other case, to coarse vibrations of the tongue.

He considers that the untrilled *r* is closely related to the vocal *r*, very much as the consonant *w* is to the vowel sound *ōō*.

The experience of those who have difficulty with their *r*'s will confirm what Dr. Bristowe says as to the existence of a difference between these two varieties, and, as we shall repeat later on, "error" is found to be a much more difficult word than "rest." But as to the absence of tongue vibrations from the *r* of "rest," we are not convinced. Between the vocal *r* and Dr. Bristowe's untrilled *r* there is, as he says, close affinity; for example, "ur-rest" is very near "rest," but to pass from the first to the second something is required, and that "something" we believe to be a vibration of the tongue-tip, and it is exactly at this point that our difficulty in articulation occurs.[3]

It seems to us that the difference between the *r* of "rest" and the *r* of "error" is not so much of kind as degree, *i.e.* a difference in the number and intensity of the vibrations.

This, we believe, is the most general view.

Leaving this point, we will return to our own observation and experience in regard to ourselves and others.

The acquirement of the *r* is one of the greatest difficulties of the child in learning to speak. It is about the last consonant to be mastered. Often a child will say "twy" and "velly," for instance, before "try" and "very."

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[1] "Dict. d. sc. médicales," article "*Grasseyement.*"

[2] Macdonald, quoted by Wyllie, "Disorders of Speech," *Edin. Med. Journ.*, October 1891.

[3] There is a diversity of usage in the employment of the term "trill." Prof. Max Müller describes both *l* and *r* as trills, and he instances the *r* in "poor," "fire," and "fir," as examples of *r*-trill.—"Science of Language," Ser. 2.

And here we may point out that, while most common Christian names have a short form in use as a pet name, in the case of those names containing tongue-tip *r*, the *r* is usually replaced by another letter, and so the difficulty is avoided.[1]

We have now to consider the fact that, while in the majority of cases this difficult *r* is ultimately acquired perfectly, yet in others the difficulty is never overcome, and the individual remains permanently unable to articulate the tongue-tip *r*.

The degree of defect may vary considerably in different persons. The following well-known line has been long in use as a test for *r's*:—

> "Round the rugged rocks the ragged rascals ran."

It is popularly supposed that this would present the acme of difficulty to a defective articulator. But such is not the case. The *r* which commences a word, and which we may call the "initial" *r*, requires a less degree of vibration than that which connects two syllables, and which we may call the "median" *r*, and this again is most difficult when preceded by a short vowel, and when the accent is on the first syllable; for instance, "very" is more difficult than "wary," and "sorry" than "glory," and "arrant" than "arraign."

Here is a sentence of surpassing difficulty, which will test to the full the reader's power to articulate the lingual *r*:—

"From mispronunciation of trills very frequently arise various harassing, embarrassing, irritating errors."

We could even put the test in a single word. Any one who can say "arrowroot," "literary," or "orrery," can pronounce any *r* in the English tongue.[2]

The pronunciation of the *r* is easiest when it is preceded by *t* or *d*, as in the words "tray," and "dray" or "stray."

Again, much depends upon the force of the expiration which produces it. It is more easily produced in singing than in ordinary speaking. It is more easily shouted than whispered. A man will articulate better upon a platform than by a fireside. Fatigue and exhaustion tend to make the defect more obvious.

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[1] Thus Mary becomes Polly; Sarah, Sally; Robert, Bob; Richard, Dick; Frances, Fanny; Dora, Dolly; Harriet, Hattie; Flora, Florence, Flo and Flos; and so on. Henry yielding Harry seems to be an exception, but Henry also formerly yielded Hal. Caroline also gives Carry, but we have known children substitute another name for this,—"Lina," for instance. Charles Dickens, who observed mos things, makes the little Jellybys call their eldest sister "Caddy."

[2] For children, an excellent test is found in the classic lines:—

"I, said the sparrow,
With my bow and arrow,
I killed cock-robin."

All the above considerations may well be borne in mind when devising modes of treatment.

The sounds produced by those who cannot say the tongue-tip *r* are various. Children usually substitute *w* or *l*, and for "very," say "vewy" or "velly."

An adult will always try not to fall into this extreme. Not unfrequently he will produce a more or less distinct (hard) *th*, "vethy"; very often he will produce the *r*-vocal without any trill, and "very" will become "vur-y"; so "irritate" will become "irr-itate," and "America" "Amur-ica." Sometimes the teeth seem to strike together during the attempt, and a thick, unpleasant, obstructed sound results.

The above substitutions of some other consonant for *r* constitute the defect which has been called "pararhotacismus." On the other hand, the substitution of the guttural for the tongue-tip *r* is called "rhotacismus." Some who at first cannot articulate *r* at all, acquire a more or less guttural *r*. Their speech is marked by an exaggeration of each *r*, the *r* being produced in the wrong place, and being rough and thick. Hence, paradoxical as it may seem, a man who has some difficulty with his *r's* will sometimes show this by the exaggerated sound which he gives to them.

If now we seek for the reason why such imperfections of articulation exist, we must consider the subject from a somewhat wider point of view.

Articulation is a muscular accomplishment, or rather a series of muscular accomplishments. Mankind vary most notoriously in their power of acquiring and perfecting muscular performances. This is seen in all games and handicrafts, in individuals, sexes, nations, and races. One thing is abundantly plain—*non omnia possumus omnes.* Another well-established principle is this: *Muscular acquirements, to be well learned, must be learned in early years.* After a time we get too old to learn, for it is not only the muscles that require developing, but the corresponding motor centre in the brain that has to be educated.[1]

If we assume that all children of the English-speaking races will, as a matter of course, acquire the power of articulating all the vowel and consonant sounds in the English tongue, we shall make an assumption which is neither probable on *a priori* grounds, nor borne out by actual fact. And if we turn to the witness of philologists we find that marked limits circumscribe man's power of acquiring speech sounds, and that this very difficulty of articulating the consonant *r* is experienced by certain individuals, tribes, and nations throughout the world.[2]

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[1] See an article on "Handicraft," by Sir J. Crichton Browne, *Nat. Review*, Aug. 1888. Republished by Slöyd Association of America.

[2] Reference has been made in particular to Professor Max Müller's "Lectures on the Science of Language," and to Kussmal's article on "Disorders of Speech" in Ziemssen's "Cyclopædia of Practical Medicine," English trans., vol. xiv.

Anyone, even though his speech organs are well developed, may be unable to utter certain classes of sounds which he did not learn in early life, and no living man is able to pronounce the speech sounds of all the nations of the earth.

"It is well known," says Max Müller, "that *r* is felt to be a letter difficult to pronounce, not only by individuals, but by whole nations. No Chinese who speak the classical language of the empire ever pronounce that letter. They say 'Ki-li-sse-tu' instead of 'Christ'; 'Eulopa' instead of 'Europe'; 'Ya-me-li-ka' instead of 'America.' It is likewise absent from the language of the Hurons, the Mexicans, the Othami, and other American dialects, and from several Polynesian tongues, and from the Kaffir language. The Kaffirs pronounce *l* for *r* in foreign words, but they have the guttural trill. The Hawaiians are taught only with great difficulty the distinction between *l* and *r*; and in several Polynesian and African languages these two letters are confused together."

Kussmaul gives an interesting account of the same defect of articulation as observed in Germany, for which we must refer the reader to the article cited. Pararhotacismus, it seems, was recognised by the Greeks, and Alcibiades is represented by Aristophanes (Vesp. 45) as saying κόλαξ instead of κόραξ.

In the "Dictionaire des sciences médicales," published in 1817, there is an article on "*Grasseyement*" by Fournier, which is largely quoted by other writers. Of course, *grasseyement* means not only failure to pronounce the *r's* of the English language, but failure to pronounce the *r's*, as heard in French. He describes one kind of *grasseyement* as consisting in the more or less complete suppression of the *r*, so that "Bordeaux" will approximate in sound to "Bodeaux." He accuses Englishmen universally of this kind of defect :—"*Les Anglais ont tous cette sorte de grasseyement.*"

He thus describes the most common kind of *grasseyement* :—"The *r* is produced, not at the tip of the tongue, but further back in the mouth, under the arch of the palate. The tip of the tongue is turned downwards and is applied to the lower incisors, or even to the gum. The air vibrates between the tongue, soft palate, and uvula."

He says that *grasseyement* may be due first to imitation in infancy in children who have been brought up amongst *grasseyeurs*. It may even be acquired by those who articulate well, if they come to reside amongst *grasseyeurs.*

Defective training in infancy is another cause. Also, he ascribes it in some cases to defective conformation of the tongue. And, indeed, other authors have thought it may sometimes be traced to a condition of "tongue-tie," or undue shortness of the *frænum linguæ.*

Certain it is that some children *grasseye* although their parents do not.

"*Grasseyement*," says M. Legouvé ("L'art de la lecture," 36th edition), "is the pronunciation of the letter *r* with the root of the tongue, in the throat . . . *Grasseyement* is a very common fault. It is seen in almost all Parisians. The Marseillais is a typical *grasseyeur*. Speaking generally, however, the inhabitants of the south of France are not guilty of this defect. The disadvantage of this fault is that it makes the utterance thick, and prevents anyone from singing in Italian. Italians could never endure this.

The Question of Cure.

We will now turn to the most important question of the possibility of treating and curing this defect.

In all the varieties to which we have referred, one common element at least seems to be present, and that is an imperfect education of or control over the tip of the tongue. Hence whatever method has been used to deal with any variety of rhotacismus or pararhotacismus must have interest for us.

French singers and actors, who have found themselves disqualified on account of their *grasseyement* for first-rate engagements upon the stage, seem to have been amongst those who have grappled most earnestly with the difficulty, and some of them are said to have obtained very complete mastery over it.

Fournier says that in languages like Italian the pure pronunciation of *r* is absolutely necessary for the distinction of words; and if in French it does not make so marked a change in the pronunciation of words, it is nevertheless very unpleasant to sensitive ears, and is a serious defect in those who are destined for the pulpit, the platform, the bar, the lecture-room, or who wish to recite or to sing.[1] Hence it should be the aim of the philosophic physician to find a cure for the defect. He then proceeds to describe the following plan. It is taken with some modification from M. Talma, a very distinguished dramatic artist, who, in addition to his inimitable gifts as a tragedian, possessed an extensive acquaintance with literature, archæology, and the fine arts.

He made it a special study to devise means of correcting all the various defects of articulation which his pupils manifested.

Talma's method.—Supposing a pupil to be affected with the ordinary kind of *grasseyement*, a word is first selected which contains but one *r*, and which begins with *t* and *r*, *e.g.* "travail" The pupil is told to commence by putting the letter *r* out of his mind and saying "tdvail." Then he must pronounce the *t* and *d* separately thus, "-t - d - avail." Insensibly he will add an *e* mute, "te-da-vail." This having been repeated several times, he must say the whole with one effort of the voice, and slowly, putting most emphasis on the first letter—"tedavail." He must then pronounce it over and over again as quickly as possible. He soon drops the *e* mute, and by combining the *t* and *d*, insensibly the *d* will vanish and *r* will take its place (says Fournier).

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[1] An English lady told the writer that she had once cured some children of defective articulation of *r* by teaching them Italian.

The reason of this is that, so far as the position of the tongue and jaws are concerned, the mechanism of articulation is the same for these letters as for *r*.

After having obtained this degree of success, the pupil must be made to understand the natural physiological mechanism by which *r* is produced. He must then put his tongue into the proper position and try to articulate the *r* alone, the teacher listening carefully to see that he does not employ the guttural.

Then the pupil may go on to the second step.

The object is to produce the syllable *re*.

He articulates several times the letters *t* and *d*, *t* being pronounced in a firm tone, *d* more softly, an inspiration being taken before the *t*. Then he adds the sound *re* to *td*, pronouncing it softly and with the same expiration as though the *re* were united to the *d*. This is not all. Soon the monosyllable *re* changes to a consonant, and *r* is produced. In pronouncing this combination, the time should be so graduated that *t* is as it were a crotchet and *d* and *re* each a quaver. At first the syllable *re* is articulated imperfectly, then the *r* makes itself heard a little, and at last the *r* comes out with a certain degree of force, which now gives an idea of its vibratile character and of the progress of the pupil.

The word "travail" and others of similar structure should now be practised repeatedly.

More difficult words should be next attempted.

The pupil will take a word without a *t*, as "ordre." Here he begins with "otede," then goes on to "otde," and finally reaches "ordre. Lastly, he proceeds to the articulation of *r* at the beginning and end of words, such as "rhétorique, plaisir." Here, again, the process is similar—"te-dé-torique," then "t-d-torique," then "rhétorique."

So in "plaisir." First, "plaisi-te-de," then "plaisit-de," then "plaisir."

Fournier says that this method is sufficient to cure *grasseyement*, but practice and perseverance are necessary, and he adds, "*Les guérisons opérées d'après les conseils de M. Talma, sont nombreuses et publiques.*"

If this is all true, the mode of cure cannot be too widely known, and we give it for what it is worth.

Kussmaul, however, tells us that Klencke states that in his experience it has always proved harmful.

Legouvé refers to Talma's method, and says that Talma himself was a *grasseyeur*, and effected his own cure.

Kussmaul makes the following remarks on treatment:—

"It is difficult to cure burring when it has existed from childhood. The patient must be first taught to apply the tip of the tongue properly to the teeth and palate, and to drive a strong stream of air against it, so as to produce a purring vibration of the organ. This purring sound must then be combined methodically at first to vowels so as to form syllables and words, and later to consonants, as, for instance, in the word "frrr-eihiet. The patient should then be gradually advanced to the more difficult words, *e.g.* "wrangel, strumpf."

"Pararhotacismus may possibly be amenable to surgical treatment, if due to shortened frænum.

"For the relief of that form of pararhotacismus in which an *s* or *ds* is placed before the *r*, Colombat recommended a special instrument called the *refoulelangue*; this was simply an ivory plate, which was placed under the tongue, and fastened to the lower incisors by hooklets."

We have now referred to almost everything that we have been able to find bearing on the subject of treatment. It is plain that we are not in a position to estimate the curability of the condition. But, on the other hand, we are certainly not in a position to pronounce it incurable. In fact our principal hope for the future lies in the fact that due attention does not seem to have been given to the subject of treatment, at least in this country. Until we have knowledge of a series of accurate and adequate observations and experiments, until we know the mode of treatment adopted in each case, the age and condition of the patient, the duration and the result, good, bad, or indifferent, of the treatment, we must abstain from coming to a conclusion on the subject, and we must in particular refrain from ceasing to seek methods of cure.

We may fairly infer from what we have observed, that the first condition of success must be the recognition and treatment from the earliest possible period. We would lay special emphasis on the importance of making systematic correction of this and all other defects of articulation an essential feature in primary education.

To secure the due recognition of such defects, every child should be tested with a series of words and sentences, containing all the vowel and consonant sounds in the English language. Such a test-table should be employed in every school. If any defect is noticed, the child should first be carefully examined by a medical expert to determine whether the speech-organs are normal. In this way the presence of defects in mouth, palate, pharynx, nares, etc., would be detected, and much good would result from their early treatment.

Anatomical defects being eliminated, the child with defective articulation should be subjected to a course of drill by means of suitable exercises, adapted to each special case.

How far such exercises are at present prepared and ready for use, is another question. The writer has made recent inquiries of the publishers of educational books for some treatise on the systematic treatment of defects of articulation in children (other than stammering). If there be such a work he has not been fortunate enough to hear of it. He is therefore anxious to ask educational authorities to consider this subject.

One further consideration may be dwelt upon.

If a child does not learn to articulate a consonant correctly, he learns to articulate it incorrectly; that is, he is acquiring a bad habit. Hence he will have something to *unlearn* before he can be cured. This is a further argument for early treatment.

Some valuable observations on this subject were published in 1888, by Mr. Alfred MacLeod of Aberdeen, in the January No. of *The Voice* (New York). He tested the articulation of 10,000 children in sixteen different schools, from the poorest classes up to the lower-middle class of society. He found that 2·94 per cent. of these had "some form of vocal impediment"; 1·82 per cent. were stammerers; 1·12 per cent. were otherwise imperfect in articulation, "as evidenced by the number of defective articulations. The most difficult letters are *r*, *s*, and *l*."

Amongst 4960 children, the failures with *r* were 43; with *s*, 41; with *l*, 30; with the remaining consonants collectively, 39.

The defect in *r* would have been greater if slight burring had been included. Many instances were found of children with some physical defect capable of remedial treatment.

In a private letter, Mr. MacLeod informs me that he has been successful in curing the defective *r*. It is a troublesome consonant. The tip of the tongue has to be "thinned" by exercises such as "id-id," and "di-di-di," repeated till agility is acquired. Then the articulating point for *r* has to be carefully shown and felt by the pupil. He calculates that it takes about ten lessons of an hour each to effect a cure, and sometimes still less. (Perhaps Scotch children may be more amenable to treatment than English.)

In regard to the case of those who are past childhood, and who still suffer from the *r*-defect, we think we are in a position to say that not many of them will ever completely lose all trace of their inability; but this does not mean that their articulation cannot be improved. We believe, on the contrary, that decided improvement may be secured. If a man can only get so far that, when he makes a special effort, he can pronounce the *r* fairly well, this will be a great gain to him. It will enable him to speak upon a platform, and to pronounce proper names and words of special importance, which without the proper *r* sound are quite unintelligible. It really does make a serious difference to Messrs. Harris, Morrow, Wright, and Perry, whether they can or cannot pronounce their own names! And if any one wishes to travel to Harrow, to Bury, or to Borough Road, it is a great convenience to him to be able to convey that fact orally to the booking-clerk, and not to be reduced to the necessity of spelling the words or writing them down; while to the clergyman, almost any price is worth paying to be able to avoid an utterance so painful as this—

"Now Bawabbas was a wobber!"

And now we propose to lay down, provisionally, the lines on which treatment of the *r*-defect should be attempted. Our proposals are based upon the foregoing considerations, and also upon our own personal experience. Of defects other than *r*-defect, we do not speak, as we have not the special knowledge of these which the struggles of many years have brought to us in regard to the consonant in question.

1. We fear that not much can be anticipated from surgical treatment. We only wish that the matter were so simple that a snip of a pair of scissors would remove the difficulty. Nevertheless the operation of dividing the little bridle beneath the tongue is so trivial and safe in the hands of a surgeon, that it is always worth while to have a tied tongue liberated. It is possible that a degree of tongue-tie may be at least one cause why some children fail to perfect their *r's* at the proper time.

2. The patient will require a teacher. Many are the qualifications which such a teacher will need, but one in .particular is essential. He must himself be perfect in his articulation. Imitation plays such an important part in speech acquirement, that this is indispensable.

3. We strongly recommend that the patient should learn to sing, and that he should diligently practise reading aloud and recitation.

To learn to sing under a competent instructor is most admirable practice for those whose articulation is defective. In singing, the consonants have to be very carefully pronounced and even slightly exaggerated. The final *t's* and *d's*, for example, have to be very well brought out. The systematic exercises which the singing-pupil goes through in this attempt have an admirable effect on the articulation whilst speaking. Reading aloud and recitation have also the effect of producing a general improvement in articulation, which helps the cure of individual defects.

4. We believe that it may be accepted that the correct articulation of *t* and *d* brings the tip of the tongue so well into action, that they lead up to the pronunciation of *r*. They are, in fact, physiologically speaking, very near akin to *r*. This is the reason why Talma and others have employed these consonants in their self-treatment, and why it is found that *r* can be most easily pronounced after *t* or *d*.

Our series of exercises should take these combinations as a starting-point. At the same time, we find that if the sibilant precedes the *tr*, the forcible current of air which produces the *s*, being momentarily held in check by the *t*, helps to produce the vibration which causes the *r*.

The other explosives, *f*, *v*, *p*, *b*, *k*, *g*, also assist in a less degree in producing the requisite vibration, but are not so efficacious in securing the lingual trill; *k* and *g* rather tend to cause the guttural *r*.

5. We believe that the practice of *singing* the exercises given, as well as saying them, will assist the pupil.

6. The acquirement of all muscular accomplishments depends upon a series of attempts persistently repeated until the right co-ordination of the muscles and the right mechanism is attained. We learn to swim by "trying to do it"; we learn to skate by stumbling along until the feet obey our efforts to control them. We learn to ride bicycles by tumbling off until we can balance ourselves and stay on. Written or oral instruction is of help in guiding the effort in the right direction, but the real secret of success consists in repeating our attempts until the muscles do what we want them to do. And on this principle alone can any man learn to articulate his *r's*.

The writer is glad to be able to quote at least one case of perfect cure. It has been communicated to him by his friend, Mr. Ernest Denny, who is now a most successful public reciter.

> "From early childhood I formed the consonant *r* incorrectly, by closing the teeth and producing in its place almost the sound of *v*, owing to a faint vibration of breath against the inside of the lower lip. Plunging into the study of elocution and the art of recitation at the age of 17, I soon found that this obstacle must either be overcome—or all thoughts of public recitation relinquished. My family—several of whom were possessed of the same defect—discouragingly impressed upon me that the failing was hereditary, and therefore incurable. In spite of this I set to work—unaided—to get my unruly tongue under control.
>
> "I learnt from the dictionary, and by questioning acquaintances, the position which the tongue should take in the mouth, and at once commenced operations.
>
> "At the outset I found myself able to articulate an enormously exaggerated and unpleasantly rough, burring *r* in most cases, and so began practising daily exercises to soften and reduce this, and to meet other difficulties as they arose.
>
> "My chief exercise was to simply prefix *r* to each vowel in turn, and in my then ragged and disagreeable pronunciation of that consonant, grind out for an hour at a time—*r-r-r-r-A*, *r-r-r-r-E*, *r-r-r-r-I*, etc., etc.
>
> "Similar exercises were made for difficult combinations of *r* with other consonants—such as *s* and *l*.
>
> "Two or three months of constant (and I must own most tedious) practice considerably softened the harshness of my *r* and enabled me to introduce my newly-pronounced consonant into conversation, which I could not do at first without painful notice.
>
> "After this the cure was more rapid, and soon from the platform no defect was noticeable; while at the expiration of a few more months, even in conversation, both my inability to form the consonant *r* and my exaggerated pronunciation of it, were things of the past."

In conclusion, the author would repeat that his suggestions are only provisional. He cannot but hope that there are others who have already worked at this same problem, and that there may be available modes of treatment of which he is not aware. If the publication of this paper should be the means of eliciting these, or of inducing others to make a practical study of the question, his principal purpose will have been fulfilled.

APPENDIX.

Suggestions for a Series of Exercises.

I. To drill the tip of the tongue by practising the articulation of dental consonants—

Repeat each of the following many times, with as great distinctness as possible :—

> "Id, id, id. It, it, it. Tit, tit, tit, tat, tat, tat. I did it, thou didst it, he did it. I had it, thou hadst it, he had it. I added it, thou addedst it, he added it. Thou conceivedst it." And so on.

II. *R* combined with *s* and *t*.

The pupil must be made to understand the normal mechanism of the articulation of *r*.

(*a*) To pronounce the word "stray."

Take a deep inspiration—pronounce the *s* with a prolonged and somewhat forcible effort. Interrupt this by bringing the tongue into the position for *t*. The teeth are to be slightly separated, the tip of the tongue being placed against the palate just behind the upper teeth ; let the tip of the tongue then be somewhat recurved so that the under surface touches the backs of the teeth. Lastly, suddenly liberate the pent-up current of breath and so add the *r* sound. Thus—"s-s-s- T—ray."

(*b*) Make a similar attempt, with the substitution of *d* for *t*. Thus—"s-s-s- D—ray."

This exercise must be practised for five minutes at a time, and may be repeated several times daily. No advantage will be gained by fatiguing the muscles, and repeated practices for short periods is likely to give the best results.

At first a loud tone of voice may be used. The pupil may be stationed at a distance from the teacher, as in a lecture-hall, etc. The words may be said or sung. When some success is attained a lower tone may be used, until the words can be pronounced accurately with perfect softness.

III. Another attempt to reach the *r* by means of *t* and *d*.

The following syllables are to be repeated as many times as a single breath will comfortably allow. They are to be pronounced both slowly and also in rapid succession. The exercise may be said or sung, and practised in the same way as No. 1—

"Tettra, tettra," etc. "Doddra, doddra," etc.

IV. To pronounce the uncombined *r*. Commence as in Exercise I. with the word "stray." Then drop the *s*, then the *t*. Thus—"Stray, tray, ray." "Sdray, dray, ray," etc.

V. *R* combined with a long vowel. (In this exercise the use of singing will be helpful. Each word is to be sung slowly, the tongue-tip being brought into position for the *r*, whilst the vowel is being dwelt upon. Then the words may be spoken slowly—then quickly.)

"Mary, wary, weary, query, dreary, fiery, wiry, iris, glory, story, hoary, rural, showery, flowery, cowrie, lawrie, angry, hungry."

VI. Median *r* with short vowel.

(This is the most difficult series of all. Each word may be used as a separate exercise and repeated many times. Every method must be tried to attain the right pronunciation. They must be said and sung, said slowly, said rapidly. The word "very," for instance, may be repeated fifty times in rapid succession, and so with the others.)

"Arrant, arrowroot, arrest, abhorrence, barometric, barrow, berry, borrow, carriage, coral, currant, error, errant, embarrass, foreign, ferret, February, flurry, garrulous, harass, horror, hurry-skurry, irritant, irrefragable, January, Koran, literary, marry, merry, morrow, miracle, narrow, orrery, parallel, peril, pyramid, paregoric, querulous, rarefy, syrup, squirrel, spirit, sorrow, terror, tyranny, very, wherry, worry."

To test the progress of the pupil, some standard lines should be taken, which he should read or recite from time to time. When he can read these smoothly, without defect and without exaggeration, the cure is complete. Such a test is for this purpose better than exercises in which attention is concentrated on the *r*. The following are especially suitable for use :—

(*a*) "The Lament of Wolsey"—Shakespeare, *Henry VIII.* Act III. Scene ii., lines 351–372 and 428–457.

(*b*) The last stanzas of Macaulay's *Horatius.*

Begin—

"He spake to the noble river
That rolls by the towers of Rome."

(*c*) 1 Corinthians, ch. xv., ver. 40 to the end.

In this last passage the painful effect of an imperfect *r* is most perceptible.

THE FREQUENCY OF THE OCCURRENCE OF GALL STONES IN THE PATIENTS OF A GENERAL HOSPITAL, AND ESPECIALLY IN THE SUBJECTS OF MITRAL STENOSIS.

By E. M. Brockbank, M.D., M.R.C.P., *late Resident Medical Officer, Royal Infirmary, Manchester.*

Statistics, as a rule, are not very interesting reading, but, as they may be of educational value, I venture to publish the following tables, which have been compiled both to show the frequency of the occurrence of gall stones in English hospital patients, and as evidence for or against the opinion which I expressed some eighteen months ago, to the effect that cholelithiasis is frequently a secondary affection excited by certain forms of heart disease.

In 1896[1] I published a few statistics bearing on the above points, which were compiled from an examination of the notes of 742 autopsies, but the present tables are the result of an investigation of twice as many cases, and are therefore, I hope, of correspondingly increased value.

The materials for this paper are drawn from the valuable and carefully kept medical and surgical post-mortem registers of the Manchester Royal Infirmary, and for permission to make use of such a rich field of research I am indebted to the kindness of the Medical Board of the hospital. In July 1891 the present pathologist to the infirmary, Dr. Kelynack, began at my request to pay special attention to the condition of the gall bladder in the various autopsies, so I am confident in stating that very few, if any, cases of even slight biliary abnormality have been overlooked in the 1300 and odd complete post-mortems which have been made under his supervision between the above date and the end of 1897—the period covered by my figures.

The patients of the Manchester Royal Infirmary are, with the exception of a very few urgent cases, all over 6 years of age, but as only cases which are "curable or admitting of material relief" are admissible into the hospital, the number of patients over 60 years of age is also small. Still the autopsies on these older subjects are sufficiently plentiful to yield satisfactory information.

Before introducing the subject-matter of this communication, I should like to point out very briefly what to my mind is the present condition of our knowledge of cholelithiasis. Recent observations seem to suggest that there are two forms of the disease, which are best defined as primary and secondary cholelithiasis.

1. *Primary cholelithiasis* generally occurs in people who are

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[1] "On Gall Stones, or Cholelithiasis."

over 50 years of age and otherwise healthy, and is probably the result of some physiological or nutritional change in the epithelial cells of the mucous membrane of the gall bladder and bile ducts, which leads to the formation of an abnormal quantity of cholesterin. It is also possible that a deficient supply of bile salts in the bile leads to the imperfect solution of the cholesterin, which is the most important constituent of gall stones, and so predisposes to the development of calculi. Not more than half a dozen cases, which can be looked upon as possibly of this form of the disease, occur in my figures, for it is rarely met with in the post-mortem room of a hospital.

2. *Secondary cholelithiasis.*—This term may be applied to those cases in which gall stones are met with in patients who have died from some other complaint. It appears at an unusually early age, and under circumstances which suggest that the development of biliary calculi is secondary to pathological changes in other organs, generally the heart or liver. Secondary cholelithiasis is practically the only form of the disease which is met with in the post-mortem room, and consequently nearly all the cases which I shall have to refer to are of this nature. Although fairly commonly found post-mortem, gall stones in secondary cholelithiasis are rarely suspected during life.

With these rather lengthy preliminary remarks I will introduce the results which I wish to lay before those readers who may be interested in the subject—

I. *Frequency of the occurrence of gall stones in the autopsies of a general hospital.*—During the five and a half years ending with December 1897, at the Manchester Royal Infirmary, 1347 complete post-mortem examinations were made, and gall stones were found in 101 (7·4 per cent.) of the subjects. This number of post-mortems was made up by the two sexes, as follows:—

921 males, and gall stones were found 37 times = 4 per cent.
426 females „ „ 64 „ = 15 „

So gall stones were about four times as common in the female as in the male autopsies.

It is interesting to compare Schröder's Strassburg[1] statistics with the above figures. This observer found gall stones in 141 of 1150 autopsies (12·25 per cent.), and his further analysis shows that calculi were present in 4·4 per cent. of his male and in 20·6 per cent. of his female examinations, the subjects being practically of the same class of subjects as my own, though he had a great many more above 61 years of age.

In the following Table (I.) I have divided the Manchester subjects according to their age and sex:—

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[1] *Loc. cit.*

Table I.—*Age and Sex of the Subjects of Post-mortem Examination.*

Age in Years.	Males.			Females.			Total.		
	Number of Post-mortems.	Cases of Gall Stones.	Percentage.	Number of Post-mortems.	Cases of Gall Stones.	Percentage.	Number of Post-mortems.	Cases of Gall Stones.	Percentage.
0–20	101	1	0·9	62	1	1·6	163	2	1·2
21–30	110	2	1·8	80	5	6·2	190	7	3·6
31–40	207	3	1·4	95	10	10·5	302	13	4·3
41–50	233	12	5·1	105	23	21·9	338	35	10·3
51–60	163	8	4·9	58	13	22·4	221	21	9·5
61 and over	107	11	10·2	26	12	46·1	133	23	17·2
Total	921	37	4·0	426	64	15·0	1347	101	7·4

A comparison of the male and female columns will show how much more prevalent gall stones are in women than in men at all ages and especially in advanced life. It will also be seen that the disease is much more common in adult life and old age than in people below 40 years of age—a fact which of course has long been recognised.

For the sake of comparison, it will be again interesting to have before us Schröder's Strassburg statistics, which show the prevalence of cholelithiasis at different ages in Germany (Table II.).

The figures in Table I., then, give a good idea of the prevalence of gall stones in the patients of an English general hospital, but as there is nothing very new to be gathered from their study I will make no further comment on them.

II. *Effect of chronic heart disease on the development of cholelithiasis.*—In 1896 I expressed the opinion that gall stones are frequently met with as a secondary affection in severe cardiac lesions, and a further consideration of the question only strengthens my belief in this view. I have gone over, as accurately as I could, the post-mortem notes for the same period as the above tables are compiled from, and have tabulated somewhat roughly the various valvular and muscular affections of the heart, which were severe enough to attract the pathologist's attention. Cases in which the heart was "somewhat flabby" or "slightly fatty" are not included in the tables which follow, and nearly all the subjects had suffered from chronic heart disease.

TABLE II.—*Age of Strassburg Subjects of Post-mortem Examination (Schröder).*

Age in Years.	Number of Post-mortems.	Cases of Gall Stones.	Percentage.
0–20 . .	82	2	2·4
21–30 . .	188	6	3·2
31–40 . .	209	24	11·5
41–50 . .	252	28	11·1
51–60 . .	161	16	9·9
61 and over .	258	65	25·2
TOTAL . .	1150	141	12·25

In Table III. it will be seen that I have divided the 1347 cases into those in which a decided cardiac lesion was present, and those in which the heart was practically normal. Of the former I found 504 cases, and in 10·9 per cent. of these biliary calculi were found; whilst of the 843 other non-cardiac cases, only 5·4 per cent. were similarly affected. So a gross cardiac lesion seems to double the risk of the development of gall stones in both male and female subjects.

The most striking figures are those in the mitral stenosis column. Under this heading are included all cases in which the mitral valve was stenosed, irrespective of other morbid cardiac conditions; and as a further and more detailed examination of the occurrence of gall stones in cases of mitral stenosis is very interesting, I venture, at the risk of wearying the reader, to give a few more figures bearing on the point.

Of course the value of the figures in Table IV. is greatly discounted, especially in the male columns, by there being so few cases of mitral stenosis to draw conclusions from. But it is a difficult matter to collect a greater number of such cases in which the gall bladder has been specially examined for evidences of incipient or developed cholelithiasis. However, without wishing to infer that one in three of all male cases of mitral stenosis under 20 years of age is complicated with gall stones, or that all men between 30 and 40 years of age with mitral stenosis have an immunity from the disease, I think it fair to assume that cholelithiasis is much more prevalent in cases of the heart lesion in question than in other subjects whose hearts are practically normal. But although such a coincident occurrence of the above two conditions is common, it is very unusual to meet with symptoms during life which lead one to suspect the presence of gall stones in patients suffering from mitral stenosis or from other cardiac lesions.

TABLE III.—*The Comparative Frequency of the Occurrence of Gall Stones in Cases with and without Heart Disease.*

Cases with Heart Disease.	MALES.			FEMALES.			GRAND TOTAL.		
	Number of Post-mortems.	Cases of Gall Stones.	Percentage.	Number of Post-mortems.	Cases of Gall Stones.	Percentage.	Number of Post-mortems.	Cases of Gall Stones.	Percentage.
Mitral stenosis	31	5	16·1	56	14	25·0	87	19	21·8
Cardiac enlargement, secondary to chronic nephritis	69	2	2·8	19	3	15·7	88	5	5·6
Cardiac enlargement, secondary to chronic and malignant endocarditis, aortic disease, chronic bronchitis, etc.	183	10	5·4	76	16	21·0	259	26	10·0
Cardiac disease, secondary to alcoholism	58	1	1·7	12	4	33·3	70	5	7·1
TOTALS of cases with heart disease	341	18	5·2	163	37	22·6	504	55	10·9
Cases without heart disease	580	19	3·2	263	27	10·2	843	46	5·4
GRAND TOTALS	921	37	4·0	426	64	15·0	1347	101	7·4

Besides finding biliary concretions in the gall bladders of subjects of heart disease, I have, on several occasions, examined bile obtained post-mortem from adult subjects who have died of chronic cardiac affections, and in which there was no macroscopic evidence of any tendency to the production of an excess of cholesterin by the mucous membrane. In such cases the bile, when taken from the gall bladder, will be found to be full of desquamated epithelial cells, floating singly or in clumps. Mixed with these cells may be found a few cholesterin crystals. If such specimens of bile be kept and be examined from day to day, in many instances it will be seen that the epithelial cells disappear gradually, and that crystals of cholesterin make their appearance in great numbers, until finally no traces of the complete cells remain, and the bile is full of the crystals in innumerable profusion. Such a remarkable change is not always met with in the bile of all chronic heart cases, but still it appears in a large proportion of them, and strengthens my view that there is a strong tendency for the cells of the biliary mucous membrane to excrete, secrete, or, perhaps it is safer to say, to produce an abnormal amount of cholesterin in cases of chronic heart disease. I am unable to give any better explanation of such an occurrence than that which I offered on a previous occasion, namely, that the lowered vitality of the system generally, and the passive congestion of the mucous membrane of the gall bladder, which accompany severe chronic lesions of the heart, predispose to the formation of an increased amount of cholesterin by the epithelial cells of the biliary passages, and, by the enforced inactivity of the patient, this excess of a crystalline substance tends to remain behind in the dependent fundus of a frequently enlarged depressed and sluggish gall bladder.

TABLE IV.—*Ages of the Subjects of Mitral Stenosis.*

Age in Years.	MALES.			FEMALES.			TOTAL.		
	Number of Post-mortems.	Cases of Gall Stones.	Percentage.	Number of Post-mortems.	Cases of Gall Stones.	Percentage.	Number of Post-mortems.	Cases of Gall Stones.	Percentage.
0–20	3	1	33·3	4	1	25·0	7	2	28 5
21–30	12	1	8·3	17	3	17·6	29	4	13·8
31–40	5	...	...	12	2	16·6	17	2	11·7
41–50	6	1	16·6	17	5	29·4	23	6	26·0
51–60	5	2	40·0	6	3	50·0	11	5	45·4
61 and over	...	...	...	...	...	...	...	...	...
TOTAL	31	5	16·1	56	14	25·0	87	19	21·8

It is a subject which requires further investigation in respect to its physiological or pathological chemistry.

CLINICAL RECORDS.

A CASE OF HEMIPLEGIA WITH CONVULSIONS.

By John M. MacCormac, M.D., *Honorary Physician to the Victoria Hospital for Diseases of the Nervous System, Belfast.*

The patient, a boy æt. 7, was brought to hospital on 28th March 1897 for convulsions and for wasting and weakness of right arm and leg.

Family history.—Good on both sides—no history of syphilis or tuberculosis. The patient is eldest of family of two boys and two girls, all healthy.

History of present illness.—The patient was healthy and well developed till the age of 3 months, when he was vaccinated. The mother states that "on eighth day from date of inoculation the left arm was greatly swollen almost to the wrist and as red as fire"; that the child slept badly on previous night, and was very feverish and restless, and this continued during the day. About the middle of the following night the child was seized with convulsions which continued for two hours; he then slept for three hours, and for about five hours lay in a state of stupor, and this continued to a lesser degree for fourteen days. Then he had a series of convulsions, with intervals of about half an hour of partial consciousness. These convulsions involved chiefly the right limbs, the left side of body being only slightly affected. During the intervals of partial consciousness the child moved the left limbs, but never the right. Convulsions continued up to three months after admission to hospital, at intervals varying from three days to two months. The loss of power in the right limbs, followed by wasting of the muscles, which commenced at the age of 3 months, has continued unaltered up to date of admission. The lower part of face was at first affected, but resumed its natural appearance one month after date of seizure.

State on admission.—There is marked wasting of both arm and leg of right side.

Right arm.—There is almost entire loss of voluntary power. The arm is adducted, forearm flexed, hand adducted, and fingers flexed.

Right leg.—The heel is raised and foot inverted, and on walking patient drags his foot and rests on the toes.

The muscles of arm and leg react to both faradic and galvanic currents, but less readily than those of left side; a mixed reaction of degeneration is present—the A.C.C. being equal to the K.C.C. Sensation is normal. Speech is unaffected.

February, 1898.—During past ten months there has been great improvement, and at the present time the atrophy of the muscles has almost entirely disappeared. The voluntary power over the arm is almost of normal extent, and the patient walks fairly well, except for a slight limping of right leg. He has not had a convulsion during past nine months.

The following points in this case appear to me to be interesting:—(1) The nature of the onset; (2) the region of the brain primarily affected.

It seems to me that the vaccination was the primary cause in this case. We have a history of much local inflammation and irritative fever, and we know that the blood changes produced during fevers are sufficient to induce both convulsions and paralysis. The immediate cause may have been the formation of a thrombus in an artery and possibly in a vein. That the lesion was situated in the cortex, is, I think, evident from the fact that recurring convulsions, specially manifested locally, are practically only seen in cortical lesions; and it appears to me possible that the occlusion by a thrombus of the second branch of the middle cerebral artery, by affecting the middle part of the ascending frontal convolution of left side, might cause the conditions above described.

This case shows the possibility of obtaining great improvement, even after epileptoid convulsions, paralysis, wasting, and contraction of muscles have continued unaltered for the long period of six years and ten months.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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Clinical Lectures on Diseases of the Heart and Aorta. By G. W. Balfour, M.D., LL.D., etc. Third Edition. London: Adam & Charles Black. 1898.

In the preface we learn that this standard work in this—its third—edition has been revised and entirely re-written, and all interested in heart disease will hasten to learn what are the new views set forth in it, and how many of the old ones have been modified or abandoned.

The chapter (xiv.) devoted to therapeutics is one of the best. Referring to Withering's statement, that "when 'the limbs in anasarca are solid and resisting we have but little to hope' from digitalis," the author insists on the importance of relieving the peripheral obstruction by purgation, drainage, or "vascular stimulants," as he terms vaso-dilators. "Digitalis," he says, "acts like a charm when delivered from the incubus of peripheral obstruction." This chapter abounds in useful hints in treatment, including that of complications. While the importance of rest is fully recognised, we are told that "cardiac patients are not to be confined to bed or to a bath chair for the natural period of their life," and "so also a weak feeble heart, or even a heart affected with a compensated valvular lesion, may be much benefited by moderate and regulated bodily exertion."

Chapters iv. and v. give, we should think, the best description in the English language of the auscultatory signs of mitral stenosis. Unlike many authors, Dr. Balfour recognises that this is the great *lesion* of the mitral valves; and he has the boldness to state that even in rheumatic cases mitral regurgitation may be dependent alone on muscle failure, following pyrexia or other debilitating cause associated with the illness.

On page 169 we read: "A transient systolic whiff may terminate in an apparently normal first sound,"—a statement that we cannot admit. Whenever the first sound is present it is so at the beginning of systole; we have no experience of the murmur of regurgitation preceding the first sound.

The author reiterates his well-known view as to the production of visible pulsation "above the fourth rib" (third ?) by an enlarged left auricle, and he says such pulsation "may" precede the apex beat. We thought that it was admitted that such pulsation was ventricular-systolic, even by those who consider it to be of auricular origin, though the result of a regurgitant current from the ventricle. In our belief it is the enlarged infundibulum of the right ventricle that occasions the pulsation in question. Fig. 15 does not convince us that we are wrong, because the heart represented is not *in situ.*

Dr. Balfour is too dogmatic (chapter ii.) concerning the distinction by means of auscultation between aortic incompetence the result of rheumatic endocarditis, and the like lesion the result of aortic atheroma. Accentuation of the aortic second sound no doubt points to an arterial origin.

We were interested to read Dr. Balfour's statement (p. 34) that the theory of asynchronous closure of the semilunar valves of the aorta and pulmonary artery respectively, in explanation of reduplication of the second sound, fails to "account for the absence of pulmonary accentuation, so conspicuous in cases of reduplicated second sound; neither does it explain the presence of a reduplicated second sound, when, as occasionally happens, there is only one set of valves to produce it." Dr. Balfour adopts now Ceradini's theory, which offers an explanation of the latter fact, but which seems to us as unsatisfactory as the abandoned theory of asynchronous closure of the two sets of valves. The bruit-de-galop, which clinically is found associated with muscle failure of the heart, and of which a double diastolic sound is an essential element, is unaccountably ignored by Dr. Balfour, as are the corresponding shocks that may at times be felt over the ventricle when the bruit-de-galop is audible. The term "right apex," as applied to the site of the right ventricular impulse, seems to us a peculiarly objectionable one, on anatomical grounds.

We miss reference to recent researches on venous pulse in the neck, the influence of the expanding auricle situated between the right ventricle and cervical vein upon such pulse during the early period of ventricular systole being ignored, although it furnishes the explanation of the peculiar undulatory movement of the vein, which has not escaped the observant eye of the author. Again, there is no reference to variation in type of venous pulse, in accordance with the activity or non-activity of the right auricle as a contractile chamber. We can in no way agree with the interpretation given of the brachycardiac sphygmogram (Fig. 27). It has been our lot to witness a large number of cases of septic endocarditis, but we have failed to notice the "*characteristic* skin eruption" mentioned on p. 350. The chromolithograph at the beginning of the book is an excellent illustration of a form of aortic disease that is a frequent cause of angina pectoris by implication of the coronary orifices.

GRAHAM STEELL.

The Blood: How to Examine and Diagnose its Diseases. By ALFRED C. COLES, M.D., B.Sc. With Six Coloured Plates. London: J. & A. Churchill. 1898.

IN the preface of his book Dr. Coles makes the statement that "this small work has no claim to originality, being more or less a compilation from other literature," but a perusal of its pages, while bearing this out, brings one to the conclusion that it derives a very distinct value from the careful and critical manner in which the author has gone over the work of others. As a result, he has produced a very useful and carefully compiled account of the morphological changes found in the blood in those diseases in which the red and white corpuscles and the hæmoglobin are specially affected. Dr. Coles has evidently spent some years in studying the normal and pathological histology of the blood, and, while contributing no new matter of his own, he presents in a very clear form the results of such workers as Gulland, Muir, Kanthack, Hayem, von Limbeck, and many others. The whole subject is admittedly in a very transitional state at present, and considerable confusion has been introduced by different investigators adopting different names for the same thing. This is especially true of the white blood corpuscles, and Dr. Coles has been at great pains to epitomise and clearly set forth the contents of the current literature on this somewhat vexed question.

The book consists of two parts. The first of these gives an account of the methods found most useful by the author in examining the blood, including an account of its normal and pathological appearances. Little notice is taken of present controversies on these subjects, and no attempt has been made to describe all the methods used by different investigators, the author contenting himself for the most part with simply stating what may be seen when certain procedures as regards staining, etc., are carried out. This method is especially of value as a means of self-instruction, or for those who have not an intimate knowledge of blood pathology.

Assistance in following the text is given by means of coloured plates, which, although somewhat crude in execution and colouring, form useful and fairly faithful representations of what anyone with a moderate knowledge of histological and staining methods can readily prepare and examine for himself. There is no other book in which the same information is given so concisely and practically, as hitherto one has had to refer to the somewhat scattered papers of original investigators on these subjects, or to the very elaborate treatises of Hayem and others, which are loaded with detail.

The second part of the volume is occupied with an account of the condition of the blood in all the different forms of anæmia. Incidentally, symptoms, etiology, and other points are discussed, but not systematically or critically, the author contenting himself for the most part with a consideration of the morbid anatomy and its value in diagnosis. Leucocythæmia is considered at great length, and here as elsewhere special attention is given to the differential diagnosis. The organisms of malaria are treated of with considerable fulness, and finally the blood condition is described in a great variety of diseases, such as pneumonia, typhoid fever, rickets, etc. In all these a reliable and accurate account of our present knowledge is given.

Dr. Coles' book has this great recommendation, that it is of a convenient and reasonable length, and, while sufficiently full, does not overburden the memory with theory or with too much detail.

Ralph Stockman.

Diseases of Women: A Manual for Students and Practitioners. By J. C. WEBSTER, B.A., M.D., F.R.C.P.Ed. Edinburgh and London: Young J. Pentland. 1898.

DR. WEBSTER is so well known in this country as an earnest and able worker in the gynæcological field, that this text-book will be received with considerable interest. That it shows evidence of wide reading and much scientific work is only what was to be expected; and that the author is not wholly absorbed in purely scientific subjects, is clear from the good practical advice which is to be found in the volume. Nevertheless, we are bound to admit that the general result falls a little short of what might have been expected. The book is made up of two portions, which are not skilfully united. The first part, composing nearly a half of the volume, appears to be an expansion of a smaller work on practical gynæcology; the latter division is devoted to the various diseases of women and their treatment. We think this arrangement, although it is not unfrequently adopted by writers of text-books, is an unfortunate one. It is rather uninteresting to read many successive pages of description of sounds, curettes, dilators, douches, plugs, pessaries, etc., with specific directions as to how and when these are to be employed, and lists of contra-indications to their use. It seems better to reserve the description of the various instruments and manipulations until they fall to be considered in the treatment of the various ailments. This plan may involve some repetition, but the other method gives a book a "cut-and-dry" style, which is not attractive, except perhaps to those who are preparing for examinations, and who rely entirely on a good memory.

The first three chapters are anatomical. In Chap. i. there is a "physiological note," which states that "true essential hermaphroditism, in which both testes and ovaries are present, probably cannot exist," and this statement is repeated in a later chapter; but there are at least three cases recorded (*Trans. Obst. Soc. London*, vol. xxxviii.) in which the presence of different genital glands in the one individual has been proved. The functional activity of these glands, of course, is a different matter. In this chapter and in others there are "comparative notes," in accordance with what seems to be a growing custom amongst some gynæcological authors. These notes are sometimes interesting but not always relevant.

In Chap. iii. there is a long account of the pelvic floor, as studied by dissection and frozen sections. The author expounds his own views very clearly, but the chapter is written in rather too controversial a style for a text-book.

Chap. v. deals with the nervous system in relation to pelvic disease, a subject no doubt of very great importance, and one which we are glad to see emphasised. We could have wished, however, that the author had stated his views in a more dispassionate manner. He has been led, no doubt by his enthusiasm and strong convictions, into a style which is in distinct contrast to the rest of the book. There is a good deal of rather "fine" writing, and even the taste of certain passages is doubtful.

Chap. vi. contains a good account of micro-organisms in their relation to pelvic disease. Then there follows a very full chapter on case-taking, including the examination of the patient, and the use of the speculum, volsella, sound, etc. It is stated that the use of the sound has during recent years been largely diminished. One may ask if it is really ever necessary for diagnosis, except on the rarest occasions. Further, the method of passing it by the sense of touch alone, and without previous disinfection of the vagina, as described by the author, is open to grave objection. It would be well if it were generally recognised that the passing of a uterine sound was only to be undertaken as a distinct gynæcological operation, and with the precautions that usually attend such an operation.

The description of operative measures in general, and of abdominal section especially, is very complete and careful. Peritonitis and pelvic cellulitis are described in a thoroughly orthodox manner. The treatment of old standing pelvic inflammation with abscess formation, by means of vaginal hysterectomy, is not mentioned in this connection, but this operation is described in a later chapter on pyosalpinx.

The chapter on hæmatocele is thoroughly up to date, especially in regard to the causation, but the value of the vaginal incision in removing the blood clot and the ruptured or distended Fallopian tube is hardly recognised. Further, in cases in which suppuration has occurred, and in which the upper boundary of the hæmatocele is formed by matted intestine, surely the safest and simplest route is through the posterior vaginal fornix, and not, as the author advises, through the abdominal wall.

Half a dozen pages are devoted to deciduoma malignum, and in that space the author gives a very clear account of the numerous and divergent views held by different writers on this subject. He gives no very definite opinion of his own views, but from the statement that it would not appear to him marvellous if the fœtal epiblast should sometimes overstep the normal range of its activity and take on malignant action, he appears inclined to believe that there is a definite disease to which the name deciduoma malignum may be applied.

The account of displacements of the uterus is excellent. The author draws attention to the fact that many of the symptoms which are often found in cases of uterine displacement are due to accompanying pathological conditions, and insists on the importance of treating these conditions.

Tumours of the ovary, and fibroid and cancerous tumours of the uterus, are all fully dealt with, and the various operations for the relief of these affections are clearly described.

The book as a whole may be confidently recommended as one which contains a clear exposition of modern gynæcological science and practice, and it should prove of great assistance to students and practitioners.

Archibald Donald.

A Surgical Handbook for the Use of Students, Practitioners, House Surgeons, and Dressers. By Francis M. Caird, M.B., F.R.C.S. Ed.; and Charles W. Cathcart, M.B., F.R.C.S. Eng. and Ed. Eighth edition. London: Charles Griffin & Co. Ltd. 1897.

The fact that this little handbook, first published in 1889, had in 1897 reached its eighth edition, speaks volumes for its popularity, and renders any review of its contents almost superfluous. The book is so handy, so well arranged, so practical and at the same time so reliable, that we may expect to find the demand for it continuing to necessitate the appearance of a new edition every year for some considerable time to come. The present edition has evidently been very carefully revised, the text is all but faultless, and the illustrations clear and remarkably easy to understand. So much new matter has been added, that this edition exceeds the previous one by forty-three pages. It is to be hoped that subsequent editions will not be enlarged with a corresponding prodigality, otherwise the useful purpose the book serves as a surgical "pocket-book" will be endangered.

This Surgical Handbook should be in the possession of every dresser.

HERBERT F. WATERHOUSE.

Lippincott's Medical Dictionary. By RYLAND W. GREENE, A.B., assisted by JOHN ASHHURST, jun., M.D., LL.D.; GEORGE A. PIERSOL, M.D.; and JOSEPH P. REMINGTON, Ph.M., F.C.S. London: J. B. Lippincott Company. 1897.

SUCH an immense tome as this is, it contains 1154 pages, can only be reviewed in the most general fashion. On an average sixty words are defined on each page, so that, roughly speaking, about 70,000 words or terms are included in the dictionary. The plan followed comprises the insertion of phonetic notation after each word, rendering its correct pronunciation a matter of no difficulty; the derivation of the majority of terms; and their definition in concise but comprehensive language. When one term is used to qualify others, the secondary names are given at full length under its heading, as, for instance, fusiform is just represented as "fiû′zi-fórm," its derivation and meaning given, and it is then entered under fusiform aneurysm, fusiform convolution, and so on.

The scheme of signs for the representation of the pronunciation appears to be well thought out and easily understood, and is much fuller than in many of the ordinary dictionaries. The adoption of a separate sign for the Scotch and German guttural "ch" is a sign of thoroughness; in an English dictionary referred to, the word "loch" is indicated by the notation "lŏk," a mistake all too frequent in residents south of Scotland, though hardly creditable in a dictionary. In the key to the pronunciation notation, a, e, and u are given six different values in each case, i five, and o seven, and even these are by no means too many. A separate symbol is also added to indicate the French nasal n.

Some of the illustrations of pronunciation appear peculiar. For instance, phthisis is given as thai s*i*s, while osteophthisis and galactophthisis are represented by *o*s-ti-*o*f′-th*i*-s*i*s, and g*a*l-*a*c-t*o*f′th*i*s*i*s, the italic *i* being short, as in pin, while an f sound is introduced into the word. In all the modifications of phthisis the i is shown as short in quality.

One or two of the references have not been sufficiently carefully adjusted; it is irritating to look up "heat-stroke" and then to be referred to "sun-stroke," the only definition of this term consisting of "see insolation." But these are very minor faults, and the whole volume bears evidence, not only to the enormous labour entailed upon the editors, but to their erudition and extensive knowledge, not only of things in the ordinary way of medical science, but of words conceived and affected by the numerous special branches which have lately enriched the world with so many new facts and, it might be added, with almost a greater number of new and often curiously hybrid words. As a work of reference it must prove of the highest value.

A. LOCKHART GILLESPIE.

Dyspepsies Nerveuses et Neurasthénie. Par le Docteur PAUL GLATZ. Bale et Genève : Georg & Cie. 1898.

DR. GLATZ has made use of nervous dyspepsia and neurasthenia as pegs on which to hang many garments more or less necessary for the complete clothing of his subject. A more descriptive title would have been "Nervous Symptoms in Diseases of the Alimentary Canal." The pain of gastric carcinoma, or of ulcer, can hardly be regarded as a form of nervous dyspepsia, still less as coming under neurasthenia. Many, too, of the practical details for testing the contents of the stomach under various conditions seem to be more applicable to a text-book on stomach diseases. Apart from this, much of the book is well worth reading where more directly connected with dyspepsia of nervous origin. But by what time will it providentially please the publishers of French books to issue them cut and furnished with an index, or even to give a short indication, at the heads of the chapters, of the principal matters therein? The additional expense of cutting the leaves, or even the trouble of preparing an index, is nothing compared with the benefits conferred on the reader. In this book a fairly copious bibliography has been added, but as it is arranged alphabetically, and with no references to the text, it is rendered of comparatively small value.

Dr. Glatz commences with an introductory essay upon the subject of nervous dyspepsia and neurasthenia in general, which chiefly consists in a plea for the use of hydrotherapy, and especially of the "drap mouillé," or "serviette mouillée." Later on, in the text, he pronounces against the English "tub," in favour of friction with a damp cloth. The question of the relative virtues of a cold bath and what we may term a "mouchoir mouillé," is evidently of great importance in his eyes.

The first chapter deals with the symptomatology and diagnosis of his subject. We note that mucous colitis is described as a simple neurosis of secretion and sensibility, without inflammation of the bowel; membranous enteritis, to an acute inflammation from a neurosis only affecting the secretory mechanism. Surely it is a pity to maintain the confusion of terms applied to these forms of colitis and enteritis. Membranous (often pseudo-membranous) colitis properly pertains to the form which follows acute infectious disease. Mucous colitis (often erroneously membranous) is a common affection in female neurasthenics; 80 per cent. of the recorded cases were in this type of patient (Edwards). The use of a boric acid solution per rectum, followed by another enema of *pepin de coing*, with subnitrate and salicylate of bismuth, milk diet, massage, and the inevitable "mouchoir mouillé" are recommended for the affection. Much of interest is contained in the book, which bears evidence of honest labour in preparation, even if the labour falls short of the preparation of an index. A. LOCKHART GILLESPIE.

Diseases of Women. By ARTHUR H. N. LEWERS, M.D. Fifth edition. London: H. K. Lewis. 1898.

THE fact that a fifth edition of this book has been called for is a sufficient evidence of its popularity. This last edition has the same merits and the same defects as its predecessors. The author tabulates many of his subjects well, and the earlier chapters are well adapted for students. But we cannot but think that it is a mistake to fill up so much space in a text-book with long accounts of clinical cases. The book would distinctly gain if many of these were omitted, while the gaps might be with advantage filled up with longer and more explicit accounts of some operations. For instance, no less than twelve pages are occupied with notes of the author's cases of supravaginal amputation of the cervix for cancer, while such important operations as vaginal hysterectomy for pelvic suppuration, and vaginal section for ovarian cysts, diseased appendages, and retro-uterine hæmatocele are altogether omitted. A case of "deciduoma malignum" is narrated; but if this name is to be taken in its literal sense, the diagnosis of the case seems founded on quite insufficient evidence. ARCHIBALD DONALD.

Therapeutisches Vademecum der Haut-und Geschlechts-krankheiten für praktische Aerzte. Von Dr. REINHOLD LEDERMANN. Berlin: W. Oscar Coblentz. 1898.

WHETHER the dissociation of treatment from the consideration of the symptoms and pathology of a disease is a procedure wholly to be recommended in the interests of scientific medicine, is a question, but the fact remains that there is a demand on the part of the profession for handbooks of this kind, and the one before us is both handy and complete. The little volume opens with a very brief sketch of the hygiene of the skin, followed by a reference to the various remedies and appliances employed in the modern management of cutaneous disorders. The reader will find concise but sufficient information concerning the nature of these, the mode in which they are compounded, and how and when they are to be used, with a long array of formulæ under each head. Indeed, one of the strong points of the work is the copious list of prescriptions to be met with, culled from all the best authors and sources. Following a custom which prevails abroad, but is scarcely as yet known here, the management of the various forms and complications of venereal disorders is discussed. Nearly one-half of the volume is devoted to these, and the directions for treatment will be found clear and to the point. W. ALLAN JAMIESON.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Clinical Tests, Methods, and Signs : The Urine.

1. Casts.

The significance applicable to the presence of albumin and casts in the urine is regarded by Porter (*Phila. Med. Journ.*, April 2, 1898, p. 587) as represented by the following—

1. "Serum albumin" can no longer be regarded as a single proteid occurring in the urine.
2. The epithelium of the renal tubules excretes the various proteids passed in the urine.
3. That from these proteids the casts are formed.
4. That there are two classes of casts, one signifying structural alteration in the renal excretory mechanism, the other not doing so.
5. That casts without albumin are not so frequently found as albumin without casts.
6. That casts (not essentially co-existent with organic diseases) may be detected in almost every sample of urine centrifuged.
7. That a study of the kind of proteid and the size and forms of cast excreted in the urine enables a diagnosis to be made with exactness as to the condition of the renal glands.

Further details of the correlation between the different forms of proteid and casts must be obtained from the original paper, as the subject is too widely treated to yield itself to brief abstraction.

(Barrie in the *Med. Rec.*, N. Y., for January last year, called attention to the great frequency with which renal casts can be discovered in the urine, should the centrifuge be regularly employed. In fifty apparently healthy prisoners he detected casts in thirteen, albumin in twenty. He quotes Shattnell's 297 cases, arranged by decades from 20 years old to 90, and yielding from 23 to 100 per cent. of the urines with either albumin or casts, although apparently free from kidney disease.)

Litten (*Wien. klin. Wchnschr.*, 1891), as far back as 1891, pointed out that centrifugalisation of the urine demonstrated the presence of are pipetted off into the centrifugaliser tubes.—[illegible])

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2. To obtain the Urine separately from both Kidney

In the same number of the journal last referred to, Harris describes and figures an instrument by which the excretion of the individual kidney can be separately obtained from persons of either sex. It can, in truth, seldom prove of value in medicine, but reveals important facts as to the *status præsens* of the kidney on whose neighbour it is proposed to operate. The instrument is in the form of a double catheter in a common sheath, each catheter separately movable longitudinally. The proximal end is curved in a similar way to a male sound, while the distal end is curved in the same way and in the same plane, indicating the exact position and direction of its prototype. Where the distal curve meets the straight portion, the two catheters pass through the tube wall, and are connected with separate bottles, both of which can be exhausted by one rubber air-pump. Apart from this apparatus is a metal lever, 24 cms. long, with a laterally flattened, curved end. After passage of the compound tube in the ordinary way, each catheter is rotated longitudinally, the proximal end of the covering tube pointing outward and backward, as revealed by the distal extremity; the angle subtended posteriorly by the catheters becoming equal to about 120° to 140°. Pressure now exerted by the lever *per vaginam aut rectum* raises the floor of the bladder in the middle line, and produces two miniature drainage areas, with a watershed between, so that the water supply from the ureter of the one side forms a rivulet quite apart from that of the other.

The descent of the water is facilitated by gentle aspiration. Each exhaust bottle now receives the unmixed excretion of the corresponding kidney, and the condition of these organs can be diagnosed with confidence.

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3. Peptones and Albumoses in the Urine.

Bang (*Deutsche med. Wchnschr.*, Leipzig, 1898, No. 2) points out that the method of Hofmeister and Salkowski for detection of the presence of albumoses in the urine is open to fallacy from the very similar reaction given by urobilin, and proposes the following clinical method, which has the merit of considerable simplicity. To 10 c.c. urine 8 grms. ammonium sulphate are added, dissolved with heat if necessary, and the mixture briefly brought to the boil. It is then centrifugalised for a half to one minute, the precipitate separated from the supernatant liquid, and rubbed up with 97 per cent. alcohol. The alcohol removes any urobilin, while, should the remainder, dissolved in water, boiled, and filtered, answer to the biuret test, albumoses or peptones are present. A remote cause for further fallacy is given by hæmatoporphyrin, but the pigment may be removed by the addition of chloride of barium and filtering. Salkowski (*Berl. klin. Wchnschr.*, 1897, No. 17) and Hartogh (quoted *Centralbl. f. innere Med.*, Leipzig, 14th May 1898, from an Inaug. Diss., Freiburg, 1897), after extensive investigations, show that urobilin is frequently mistaken for peptone and albumoses in the urine because of its reaction to the biuret test.

Lenobel (*Wien. klin. Rundschau*, 1897, No. 27, quoted *loc. cit.*) points out an important point with regard to albuminous urines, which also contain proto-albumose. Proto-albumose, isolated from the urine, has a very strong action in preventing the coagulation of albumins in the ordinary methods used in practice.

Haack (quoted *Schmidt's Jahrb.*, Leipzig, 1898, Bd. iii.) employs the addition of an amount of absolute alcohol five to ten times the volume of the urine, and extraction of the precipitate, formed after twenty-four hours, with boiling water.

Rosin (quoted *Centralbl. f. d. Grenzgebiete d. Med. u. Chir.*, May 1898) records the case of a woman of 36, with head and back-ache, or debility. The urine gave a large deposit with Heller's test, and contained casts and thickened epithelium. In spite of the absence of all the general signs of acute, chronic, interstitial, or parenchymatous nephritis, the case apparently was one of Bright's disease; after three weeks, when the patient had not been relieved from her symptoms by iodide of potassium and milk diet, it was found that the urine contained no albumin. Heller's test gave a dense, opaque, white ring, but this cleared up on heating, and reappeared on cooling, beginning first at 53° C. to precipitate, at 72° C. to disappear again. The precipitate was formed of albumose. The patient died, and was found to have been suffering from sarcomatous growths in many of the ribs.

4. DIABETES.

STERN (*Med. Rec.*, N. Y., 21st May 1898) has devised a small, neat, and, from the description, a sufficiently accurate apparatus for clinical work, to facilitate Robert's fermentative estimation of dextrose in urine. Its essential feature consists of two glass tubes, one wide to contain 100 c.c., the other narrow for 50 c.c. of urine. The tubes are united together by a solid glass curved tube, and stand upright on a wooden pedestal. In the narrow tube 50 c.c. of urine are placed, and a urinometer is put in, the whole being covered with a cap. Into the broad tube 3 or 4 grs. of yeast and 100 c.c. of urine are introduced, and another urinometer employed, the stem passing through a metal adjustable cap. After twelve to fifteen hours the difference in the readings will indicate the loss of sugar, 1° equalling 0·2196 grm. dextrose per cent., or 1 gr. in a fluid ounce.

Several papers have been published in connection with the diagnosis of diabetes, by means of the appearance presented by the red blood corpuscles, after staining with various aniline dyes, such as methylene blue 1 per cent. for one or two minutes, congo red, and Ehrlich-Biondi's fluid. Each of these differentiates between healthy and diabetic blood by the colour or absence of colour produced (Bremer, *Centralbl. f. innere Med.*, Leipzig, 7th June 1897, and 2nd April 1898; Lœwy, *Med. Week*, Paris, 1897, p. 539; Marie and Goff, *Semaine méd.*, Paris, 5th May 1897; Baduel and Castellani, *Settimana med. d. Sperimentale*, Firenze, 1898, No. 10).

5. ALBUMIN.

HUSCHE (*Wien. med. Wchnschr.*, 1897, No. 34) points out the possibility of there being a frequent fallacy attendant on Heller's test. In concentrated urines, when the acid has been so added as to form a distinct line of conjunction with the urine, a cloud is formed from the urates present, which vanishes on heating, and which can be hindered by previous dilution. The author found, in most urines that he tested, a similar cloud, entirely independent of the concentration of the urine or the quantity of urates. Unlike the first (and unlike proto- or hetero-albumose, it may be added—A. L. G.), this cloud does not completely disappear on heating, while dilution of the urine increases rather than diminishes it. This he considers to be due to nucleo-albumins. Should a urine contain the ordinary coagulable proteids, excess of urates, and these nucleo-albumins, the coagulated and precipitated substances may be perceived to form three rings, in place of the two hitherto accepted. The albuminous ring, or cloud, forms the lowest of the three in the test tube; over it comes a clear zone; then the opaque ring of urates, in which the author's powers of vision enable him to detect a denser portion, also ring-like in form, which consists of a layer of coagulated nucleo-albumins.

Further, Jolles (*Wien. med. Wchnschr.*, 1897, Bd. xlvii. S. 22) shows that in cases of pseudo-leukæmia, a milky precipitate falls on addition of acetic acid, which, after solution in carbonate of sodium, is not brought down by saturation with magnesium sulphate. This body he recognises as nucleo-histon.

6. Uric Acid.

Riegler (*Wien. med. Bl.*, 1897, No. 21) describes a method of estimating uric acid by volumetric measuring of the gas evolved by the addition of dilute but still strong nitric acid to the urine. It would be superfluous to mention here the details of the separate factors necessary for calculating the proportion of uric acid; not only the pressure of the atmosphere and the temperature of the air have to be reckoned with, but the tension of the steam given off by the urine when boiling, accounted for. A very simple method, as the author remarks, but bristling with rather too many sums for the practitioner unacquainted with anything beyond the rule of three.

Tunnicliffe and Rosenheim, in the *Brit. Med. Journ.*, London, for 4th February of this year, advise the use of piperidine as a reagent for the estimation of uric acid. This body forms soluble salts with the acid. To estimate the actual amount present, the uric acid in 100 c.c. is precipitated with ammonium chloride, the ammonium salt split up by hydrochloric acid; the uric acid thus obtained washed free from hydrochloric acid and tested with a solution of piperidine added from a burette; 0·425 grm. piperidine equals 0·84 uric acid.

7. Renal Permeability.

Achard and Castaigni (*Gaz. hebd. de méd.*, Paris, 1897, tome xliv. p. 37) inject hypodermically 0·05 grm. of 5 per cent. solution of methylene blue, after the bladder has been emptied, and get the patient to pass urine a half, one, two, three hours, and so on. The first appearance of a green tinge, or abstraction of the blue after shaking with chloroform, normally begins in half-an-hour, the amount in the urine increases for three or four hours, and does not entirely disappear until from thirty-five to fifty hours have elapsed. In disease of the kidneys, the reaction appears much earlier. The conditions leading more especially to this earlier elimination are found in functional kidney diseases, and in diffuse, acute, or chronic affections of the renal interstitial tissue. The authors regard the method as one capable of affording much information in cases where there is albumin in the urine but no casts, or *vice versâ*. Bard (*ibid.*, 1897, tome xliv. p. 42) fully corroborates the conclusions of these authors, who again return to the question, as especially concerned with cases of congestion brought on by nephritis (*ibid.*, 1898, No. 16). The test here again fulfilled anticipations, and, moreover, was found to contitute a valuable clinical method of testing the condition of the renal tubules, quite independently of changes in the diet or in the environment.

SURGERY.

UNDER THE CHARGE OF

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RETROGRADE INCARCERATION IN HERNIA.

This form of strangulation, which was first described by Maydl, does not involve the herniated viscus within the sac itself, but in the peritoneal cavity, before entering, or after it has left, the internal ring. It can only be met with in viscera possessing a certain length and mobility, *e.g.* intestine, omentum. Cases have been recorded where the omentum within the sac itself has presented a normal appearance, while the continuation of it within the belly cavity presented the appearance of commencing gangrene. Professor Carl Bayer records a recent case in a woman of 54, who had suffered from a left labial hernia for fifteen years, and who developed the phenomena of strangulation. On opening the sac, there was found a large portion of omentum, in the form of a loop, of which the veins were distended. A finger could be passed through the internal ring alongside of the protruded omentum, and yet the latter could not be drawn down into the sac. The inguinal canal was therefore laid freely open. The proximal, or entering loop, of omentum was twisted several times on its own axis, and was intimately adherent at the internal ring; while the peripheral, or free end of the loop, was swollen, brownish-black in colour, and in a condition approaching gangrene. The omentum was removed—a radical cure performed, with subsequent complete recovery.—*Centralbl. f. Chir.*, Leipzig, 30th April 1898.

TREATMENT OF STONE IN THE BLADDER, ASSOCIATED WITH ENLARGED PROSTATE.

Dr. Keyes, of New York, who has always been a strong advocate of litholapaxy whenever practicable, is now inclined to curtail its application. When stone complicates enlarged prostate, if the condition of the latter be such that, were the stone absent, no operation would be called for, then the question is to be solved by deciding whether the obstructive quality of the prostatic enlargement, and the resentment of instrumental interference on the part of the prostatic urethra, are sufficient to make litholapaxy impossible, or to make it possible only at the expense of leaving the patient worse than before. If such conditions do obtain, then the stone should be removed with the knife. The mere size of the prostate is not a factor in the problem. The size or position of the stone is not a factor, except in the case of encysted stone. The smallness of the stone is relatively an argument against litholapaxy, since the symptoms in such a condition must be ascribed rather to the prostate than to the foreign body. If lithotomy be performed, the suprapubic route should be selected, since this opens the door for more perfect work, and allows the surgeon to remove obstructions, such as a third lobe or outstanding horse-collar enlargements, and to lower the vesical end of the urethral floor, thus accomplishing all that could be done by a more extensive prostatectomy, without very seriously increasing the operative risk.—*Ann. Surg.*, Philadelphia, May 1898.

POST-OPERATIVE DELIRIUM AND INSANITY.

THIS subject was discussed at a recent meeting of the Surgical Society of Paris, at which the members related their individual experiences as follows:—

M. Picqué questioned the accuracy of the common belief, that mental symptoms following an operation are related to each other as cause and effect. After major operations upon the uterus and its appendages, there may ensue a delirium, which may be due to iodoform or septic intoxication. Mental disturbances are, however, more common after minor gynæcological operations, and are rather to be ascribed to the peculiarities of the patient than to the nature of the operation.

M. Richelot had observed eleven cases in which cerebral disturbances had followed upon operations in the sexual organs. There were two cases of vaginal hysterectomy followed by mania, and ending in recovery. There were three cases in which minor operations were followed by insanity, but in which the patients were really insane before operation, and had disguised their condition. In the remaining six cases the patients were predisposed to mental instability, and the operation only played the part of the exciting cause. The result would probably have been similar had the operation been performed on any other part than on the genital organs.

M. Regnier was of much the same opinion, and maintained that no operation really "gives birth" to insanity. Like the anæsthetic, an operation may reveal certain latent tendencies, but does not create them. In three cases of acute mania following ovariotomy, there were marked hereditary or other predisposing causes. In old women, in whom an operation may be followed by symptoms of mental impairment, we are really dealing with patients in whom the nervous system is undergoing senile decay, and the operation merely precipitates the break-down. It is important that the surgeon should be able to recognise the hysterical or neurasthenic patient, who is remarkable for the disproportion presented between the symptoms complained of and the lesion discovered on examination. Such patients may improve for a time after operation, only to develop fresh psychical troubles at a later period.

M. Monod had observed a fatal case of delirium, following double ovariotomy, which was apparently of uræmic origin, and a second case of mania in a male, after amputation of the thigh during acute septicæmia; also a third, an abdominal hysterectomy for fibroids, the patient developing insanity six months after the operation, apparently as the result of domestic anxieties (loss of husband and fortune).

M. Segond has little faith in the production of mental troubles by gynæcological operations. Of 642 cases of hysterectomy and bilateral ovariotomy, he had only met with four in which the operation was followed by psychoses, and in all of them the patients were predisposed by inheritance or other factors. Whenever there exists a proper indication, the surgeon should not be deterred from operating through fear of any subsequent mental instability.

M. Lucas-Championnière held similar views, and had observed the disappearance of mental symptoms complicating menstrual disturbances, by operative treatment directed to the latter.

M. Routier had observed violent delirium following an operation for appendicular peritonitis, which recovered completely at the end of five weeks; also melancholia, some time after instituting drainage of the bladder for enlarged prostate, which disappeared on closing the fistula; also delirium with hypochondriasis, after double castration.

M. Hartmann did not think that the nature of the operation had much influence on any subsequent mental disturbances which might develop; ovarian castration had no special tendencies in this direction. He was inclined to lay stress on the profound mental impressions which may attend any operative interference, and to septic and other intoxications.

M. Potherot maintained that if we exclude the pseudo-mania, or delirium resulting from alcoholism, from the anæsthetic, from iodoform, etc., it will be found that real post-operative mania is very rare; that the subjects of it, while chiefly met with in gynæcological practice, are the victims of sufficient mental predisposition to account for its occurrence.

M. Tuffier referred to the infrequency of post-operative delirium in children. In a boy of 12, on whom he had operated for the radical cure of inguinal hernia, the mental disturbance was evidently hysterical, and of very short duration. He had observed mania, lasting for thirty days, after clearing out the mastoid antrum in a woman whose mother had died insane.

M. Poirier had met with three cases of mania after ovarian castration. One of these recovered within a month, while the other two committed suicide.

M. Bouilly, among several thousand operations, had only observed five cases, and two of these were insane before the operation; a third was in a state of senile dotage; in the remaining two, the mania followed upon unimportant operations, and was quite unexplained. He believes that the exaggerated fear of operation, which one often meets with in women, is an important factor in the production of mental instability, and recommends regarding it as a contra-indication, when very pronounced.—*Rev. de chir.*, Paris, April and May 1898.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Dr. Jellett, in the *Brit. Gynæc. Journ.*, London, for February 1898, gives a résumé of Dublin gynæcology.

In Dublin there are two classes of hospital in which gynæcological cases are treated, namely—(*a*) special, (*b*) general.

(*a*) The special include—(1) The Rotunda, with thirty-six beds; (2) the Coombe, with nineteen beds; and (3) the National Lying-in Hospital, with eight beds—making a total of sixty-three beds.

(*b*) The general are seven in number, with a total of fifty-eight beds. There are thus 121 beds in Dublin available for gynæcological cases, and these are always occupied.

This large number is accounted for by the fact that patients come to Dublin from all parts of Ireland except the north-east counties. The total number of cases treated during 1897 was 1223; there being 159 major operations, with ten deaths, and 576 minor operations, with one death.

1. In the *Rotunda Hospital* there were seventy major operations, with seven deaths, and 334 minor operations, with one death.

Major operations—(1) Fifteen ovariotomies, with one death, due to septic pneumonia; (2) fifteen salpingo-oöphorectomies, with one death, due to intestinal obstruction from adhesion and kinking of the bowel; (3) six removals of appendages for ruptured tubal pregnancy, or hæmatosalpinx; (4) nine panhysterectomies for myoma, with two deaths, one from intestinal paralysis, the other from collapse during operation (latter suffered from great debility, due to menorrhagia); (5) one abdominal cœliotomy for septic peritonitis died; (6) three myomectomies; (7) three abdominal abscesses, one died of tubercular peritonitis; (8) three abdominal cœliotomies; (9) four for ventral hernia; (10) three vaginal hysterectomies, one for myoma, two for carcinoma cervicis; one of the latter died from suppression of urine, and, post-mortem, was found to have granular kidneys; (11) eight colpotomies.

Of the 334 minor operations, one died from acute sepsis, after curetting the uterus for endometritis.

In the *Coombe Hospital* there were six major and forty-seven minor operations, with no deaths.

No statistics are given of either the National Lying-in nor Mater Misericordiæ Hospitals.

In *St. Vincent's Hospital* there were forty-five major and sixty-five minor operations, with no deaths. The major operations were—five hysterectomies, twenty-two ovariotomies, two oöphorectomies, one removal of broad ligament fibromyoma, five salpingotomies, one removal of appendix, one cœliotomy for ruptural tubal pregnancy, one radical cure of ventral hernia, and four exploratory cœliotomies.

In the other five hospitals there were thirty-eight major operations, with three deaths, and 130 minors, with no deaths.

Sir Patrick Dun's Hospital.—Eighteen major, two died—one nephrectomy for suppurating kidney, the other panhysterectomy for myomata. There were eighty-four minor operations, with no deaths.

Adelaide Hospital.—Ten major, all recovered.

City of Dublin Hospital.—Two major and eight minor, all recovered.

Stephen's Hospital.—Four major and twenty-nine minor, all recovered.

Richmond Hospital.—Four major, one died from septic peritonitis after removal of ruptured pyosalpinx; nine minor, recovered.

Dr. Jellett considers that this is a very low death rate, and attributes it largely to the asepsis which is observed in operating; he describes the antiseptic precautions which are taken in the Rotunda Hospital,* which are briefly as follows:—

The operating theatre is divided into two portions by a glass partition; the larger portion is reserved for the students, sterilisers, and basins; the smaller for the operator, assistant, anæsthetist, and nurses. The patient is anæsthetised before being brought into the theatre, where a sterilised dressing-gown is put on. The instruments are sterilised by boiling; the towels, operators' coats, dressings, etc., by steam. None but gauze sponges are used, and are destroyed after use. In addition to the preparation of the patient beforehand, the skin is washed with ether and corrosive sublimate, 1 in 500, by the operator immediately before operation. The walls and floor of the theatre are such that they can be flushed with a hose, and this is done the day before operation.

ACUTE TUBERCULOSIS IN PUERPERAL WOMEN.

THREE interesting cases of what would appear to be the commencement of tuberculosis during the puerperium are related by Coll, and are of importance in showing how closely such a condition may simulate the clinical phenomena met with in septic infection at this period.

In Case 1 the temperature, previously normal, suddenly rose on the tenth day to 104° F., and remained elevated for some weeks, the strength of the patient rapidly diminishing. At first no pain or local indications of pelvic disease were apparent, but in due course an irregular mass in the right inguinal region manifested itself. On an exploratory abdominal incision being made, the mass was found to be tuberculous, arising from the tube and involving the intestines and mesentery. The abdomen was flushed with saline solution and closed, a procedure which was followed with most beneficial results.

In Case 2 the temperature rose on the third day after delivery to 104° F., without any apparent local cause; it was decided, however, to curette the uterus, the results of which were entirely negative. For the next four weeks the patient's condition seemed highly critical, the temperature rising to 105° F., while the fever was associated with intense perspiration, abdominal distension, and pulmonary symptoms.

Pleuritis with effusion being present, the chest was tapped, and the fluid examined. This was shown to contain tubercular bacilli, which were also found in the sputum. The case was now treated on different lines, with evident benefit, and a slow but maintained improvement still continues.

The third case showed symptoms almost identical with those already stated in Case 2, the fever having developed on the third day of the puerperium. The patient was treated as one of septicæmia, but with no avail, as she died on the twenty-first day. Post-mortem examination revealed both lungs riddled with miliary tubercles.

In none of the cases reported did the women present any evidence of tuberculosis before labour. The family history of all three was negative. The sudden development of the symptoms is extremely difficult to account for, and undoubtedly tends to mask the true type of the disease.

The time of invasion, the temperature curve, and the absence of any discoverable lesion, make them liable to be regarded as septic; while, on the other hand, the favourable termination of two of the three cases is very unusual.—*Boston Med. and S. Journ.*, 1897.

TWO CASES OF ECTOPIC GESTATION OCCURRING TWICE IN THE SAME PATIENT.

DR. SCHOOLFIELD describes (*Am. Journ. Obst.*, N. Y., March 1898) the following cases:—

CASE 1.—Mrs. C., æt. 27, had been operated on for ectopic pregnancy three years previously. Her health after operation remained good, and she menstruated regularly till November 1893. She missed her period in December, and presented the ordinary signs and symptoms of pregnancy. On January 1, 1894, had slight and irregular flow, with colicky pains, lasting one week; February 25, had more severe pains, hæmorrhage, and syncope. On May 7, after careful examination, a tubal pregnancy, which had ruptured into the broad ligament, was diagnosed. The patient was again operated on, and the diagnosis corroborated.

CASE 2.—Patient, æt. 29, operated on in June 1892 for abdominal pregnancy, three months after full term and death of child. She made a good recovery, and remained in good health. Later, in April 1896, she was attacked with severe pain and vomiting, and when seen had high temperature, distended abdomen, extreme tenderness, especially in left iliac and right hypochondriac regions, and was profoundly icteric. She gave a history of irregular menstruation, with colicky pains; of shock, with syncope; and the passage of a pseudo-deciduary membrane. Tubal pregnancy was diagnosed, and the patient operated on in May, but died three hours afterwards. At the autopsy the left tube was found ruptured, and contained a portion of the placenta; the density of the adhesions prevented the removal of the uterus and appendages for satisfactory examination. A calculus the size of a pigeon's egg was found in the gall bladder.

In the same journal for April, Dr. Dorland describes another similar case. The patient, a multipara, æt. 28, was operated on in October 1890 for a ruptured tubal pregnancy. In July 1892, two years later, she again presented herself, suffering from a similar condition, and was operated on in August, when a right-sided tubal abortion was found. She made an uninterrupted recovery.

Dr. Dorland proceeds to give a *résumé* of the authentic cases of repeated extra uterine gestation, which, he states, are fifteen in number. The interval before recurrence varied from six months to five years, but he does not state whether any of the patients had had a normal pregnancy during the interval. Special interest is attached to the cases recorded by Coe, Hayden, and Prewitt, as in their cases the recurrence was in the same tube, both being discovered in different stages of development at the one operation.

INTRALIGAMENTOUS RETROPERITONEAL ECTOPIC GESTATION.

DR. DUNNING of Indianapolis describes this form of ectopic pregnancy, and believes it is of sufficiently frequent occurrence to merit a separate classification. He states that it is met with in the later months of pregnancy, and illustrates it by a case on which he operated, two months after full term and spurious labour. He says that the ovum projects free into the abdominal cavity, and its abdominal portion is entirely covered by peritoneum, and that at the promontory of the sacrum the posterior parietal layer of the peritoneum is reflected on to the posterior surface of the ovum. This peritoneal covering is derived from the broad ligament Fallopian tube, one lateral pelvic wall, the posterior surface of the uterus, the cul de sac, and the posterior parietal peritoneum. He believes that this form is of much more frequent occurrence than that described by Berry Hart, in which the ovum as it develops lifts the peritoneum off the posterior surface of the uterus, a portion of the anterior surface, and away from the lateral and anterior walls of the abdomen; so that the fœtal sac is insinuated between the peritoneum and these organs and tissues (quoted *Brit. Gynæc. Journ.*, London, Feb. 1898).

THERAPEUTICS.

UNDER THE CHARGE OF

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Changes in the Blood produced by Heat and Cold.

Friedländer (*Bl. f. klin. Hydrotherap.*, Wien, February 1898) has found that—(1) Long exposure of a limb to cold causes in the blood decrease in number of red corpuscles, increase of leucocytes, lowering of specific gravity, no change in specific gravity of the serum. (2) In the reaction stage after short exposure to cold, he found increase both of red and white corpuscles, increase of specific gravity, no change in specific gravity of serum. (3) After application of warmth, increase of red and white corpuscles, especially of the latter, increase of specific gravity of blood, decrease of specific gravity of serum.

These observations show, according to the author, that under the influence of heat and cold the blood becomes differently distributed in the large vessels and capillaries. He thinks there is no question of an actual increase or decrease as regards the red cells, but holds that the contrary is the case for the white cells.

Action of Physostigmine on Intestine.

Traversa has published the results of an investigation into the mechanism of the action of physostigmine on intestinal movement (*Policlin.*, Roma, 1st January 1898), the chief conclusions of which are—

1. Physostigmine may cause slight or violent increase in the intestinal peristalsis, even up to persistent tetanic contraction. If the longitudinal muscular fibres are specially affected, the intestinal tube is

bent on itself in places; if the circular fibres are most involved, annular constrictions are prominent, or the two may be combined.

2. These movements are stopped by giving atropine, and do not occur after its previous administration.

3. The central nervous centres have no influence in causing these phenomena, as they occur after division of the vago-sympathetic nerve, and after destruction of the lumbar cord. Destruction of the abdominal sympathetic ganglia has also no effect.

4. A loop of detached intestine, kept alive by artificial circulation, is affected exactly as is the intestine of the live animal, by physostigmine.

5. In a similarly detached loop, under the influence of physostigmine, the circulation of blood containing atropine causes cessation of the muscular spasm and dilatation of the blood vessels.

6. Physostigmine exerts its action by stimulating the peripheral motor nerves of the intestine. (The mode of experiment adopted is, however, incapable of proving this definitely.)

7. The antagonism between physostigmine and atropine, as between pilocarpine and atropine, is one-sided, that is, these substances do not nullify the actions of atropine.

The Permeability of the Epidermis to Solid and Fluid Drugs.

Filehne has contributed a short description of certain observations made on this subject and under his guidance by Dr. L. Mahn (*Berl. klin. Wchnschr.*, 17th January 1898). He begins by stating that all previous observations of this kind have been made on the skin as if it were a simple structure, whereas it consists of epidermis, sweat glands, and hair follicles, all of which may serve as channels for absorption. For practical purposes it is probably not of much consequence to the physician by which of these channels remedial applications become absorbed, so long as absorption takes place; but no doubt exact knowledge in this respect has a practical as well as a scientific interest. In the present research, attention is directed entirely to the epidermis, the glandular structures of the skin being left for a future occasion. He put before himself the query, "What are the conditions under which a substance can penetrate through the epidermis, and for what substances are these conditions actually fulfilled?" Seeing that the inquiry was confined to the epidermis, it was impossible to employ the human skin directly, for the simple reason that there is no means by which the skin glands may be excluded while the epidermis remains intact. He points out that absorption by the epidermis cannot take place by the vital activity of its cells, but must be a purely physical process. Hitherto, it has been generally assumed that vapours only can pass through the skin, or substances which are capable of being easily volatilised, but he thinks the error of this view is manifest when we consider that chrysarobin, cantharidin, and many other bodies of high boiling-point undoubtedly are absorbed. The epidermis cannot be considered as a membrane which allows osmosis to take place, or is penetrable by water, as this only occurs after its fats have been thoroughly extracted by alcohol and ether. Owing to its containing lanolin, sebaceous matter, and other fats, only those substances can pass through it which are capable of dissolving these fats or of mixing intimately with them.

He has, therefore, studied the subject indirectly, by ascertaining what substances mix freely with or dissolve up lanolin and olive-oil. This constitutes a certain fallacy, as these are not the same fats as are present in the human skin; but he is at some pains to show that the results are not thereby vitiated, as the conditions are practically the same. It has been frequently shown, and is now generally admitted, that the human skin is not permeable to water, and hence that no absorption takes place in a bath, even although the outer cells of the epidermis do swell somewhat. To make lanolin absorb water, the two have to be very thoroughly rubbed up together, and, no matter how long they are left in contact merely, mixture does not occur.

It was found that sodium and potassium chlorides, potassium iodide, ferrous carbonate, arsenious acid, and tartar emetic were not taken up in solution by the lanolin, and therefore are not absorbed by the epidermic cells. Filehne also rubbed blue ointment into his own skin, and on cutting out small pieces, and examining them under the microscope, it was evident that the cells of the epidermis did not contain the smallest trace of mercury.

Sulphur, corrosive sublimate, lead acetate, lead oxide, iodine, ferric chloride, and ferrous sulphate,—all form such combinations that they are capable of absorption by the cells of the epidermis. The following organic substances are capable of solution in the fats of the skin, and are therefore more or less readily absorbed—alcohol, ether, chloroform, oil of turpentine, oil of mustard, phenol, iodoform, camphor, chrysarobin, croton-oil, nicotine, cocaine, strychnine, and other bodies. (The salts of the alkaloids do not combine with fats, and therefore no absorption occurs.)

Finally, he points out that the question has a wide biological interest. For those mammalia which inhabit water, the impermeability of their skins to water and substances dissolved in it is a necessary condition of their living, but the same arrangement is found in all mammalia.

Resuscitation in Emergencies under Anæsthetics.

Mr. Alex. Wilson read a paper on this subject before the Society of Anæsthetists (*Clin. Journ.*, London, 9th Feb. 1898). Such emergencies may occur from some untoward effect of the muscular disturbance during the period of excitement, but much more frequently they are due to premature and unexpected paralysis of the circulation or respiration, and arise from some peculiarity in the patient or irregularity of the administration. After discussing these briefly, he passes on to a detailed consideration of the means usually recommended for resuscitation:—

1. *External applications of an irritating nature*, having for their object the exciting of respiratory movements reflexly, are all condemned as useless, owing to the depth of anæsthesia and the unresponsive condition of the nerve-centres.

2. *Procedures of a nature which originate respiratory movements*, such as rhythmical traction on the tongue, and dilatation of the sphincter

ani. As regards the first of these, Wilson says that the alternate pulling of the tongue forwards and allowing it to sink backwards will produce the apparent effect of stimulating respiration, by alternately freeing and obstructing the opening of the larynx, but he thinks it has no real value as a respiratory stimulant. Interference with the anus no doubt reflexly stimulates respiration, but in profound narcosis this is absent, and under chloroform is always more or less uncertain.

3. *Direct mechanical or electrical stimulation of the heart by pressure, rapid percussion, faradisation, acupuncture, and position.*—The selection of a reasonable method for stimulation of the heart is beset with difficulties. For example, when the condition of the pulse shows that the circulation is failing, we have no sure means of knowing whether this failure is due to nervous inhibition of the heart's action, to actual paralysis of its muscle, or to extensive vasomotor paralysis. Also, we have a very inexact knowledge of how far the above remedies actually affect the heart. Faradisation, acupuncture, percussion, are all very uncertain and of doubtful utility. Intermittent pressure, however, such as may be obtained by performing artificial respiration so as to compress the ribs, is considered as valuable by the author. This exerts a certain amount of pressure on the heart, causes it to empty itself, and assists its contraction. Hence the blood pressure is kept up, and the circulation through the lungs made easier. Pressure on the epigastrium is also valuable in this relation. As regards position of the body, there is considerable difference of opinion as to how it affects the heart and circulation, and probably a good deal depends on the degree of arterial tone and the extent to which the blood in the vessels is under the influence of gravity.

4. *Artificial respiration.*—In many cases artificial respiration is only of value in so far as it tends to stimulate the heart and circulation. In other cases, where the respiratory centre is chiefly affected, its action is more direct. Wilson prefers Sylvester's method to all others, as it enables the largest amount of air to be introduced into the lungs, it can be carried on with considerable compression of both sides of the chest, the patient can be partially inverted at the same time, it does not entail moving the body, and it can be easily managed by one person. During its performance, it is necessary to keep the upper air passages clear by pushing the lower jaw forward, and to have no strain on the front of the chest such as occurs when the head is allowed to hang down over the table. If faradisation of the phrenic nerves be employed, it should always be combined with artificial respiration.

5. *Measures which raise the blood pressure*, such as transfusion, rectal enemata, pressure on abdomen, the dependent position, etc. In nearly all cases there is depression of the vasomotor centre and excessive dilatation of the abdominal and other vessels, "the patient being bled into his own vessels." In some cases this alone is the cause of the collapse, and here inversion is of the most undoubted benefit, as it causes the blood to gravitate to the head. A gentle inclination is all that is required, complete inversion of the body being unnecessary. The other measures mentioned are, in the author's opinion, not of much avail in raising the general arterial tension. Artificial respiration is, however, of undoubted value.

6. *Nitrite of amyl, strychnine, digitalis, ether, and atropine given subcutaneously.*—Wilson considers that, owing to the condition of the circulation, these are not likely to be absorbed sufficiently rapidly to be of much use. It is only when there is a comparatively active circulation that in his opinion they can be of value.

In conclusion, he states that "of all these different methods the only ones of any real use are the partial inversion of the body with artificial respiration, varied, if need be, with temporary adoption of the vertical position; if these do not quickly restore the patient, nothing else will."

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Cardiac Valvular Diseases.

Tuberculous endocarditis.—We have already referred to tuberculous myocarditis, which is a rarer lesion than a similar endocarditic affection. The latter is, however, sufficiently rare as a primary lesion to merit special attention being paid to it. Benda (*Deutsche med. Wchnschr.*, Leipzig, 1898, No. 7) refers to an interesting case, in which a chronic tubercular endocarditis proved fatal by culminating in a general miliary tuberculosis. There is room for doubt, however, as to the relationships of the lesions, since the patient had been the subject of hip disease for some time. He was a boy, æt. 10, who died of acute miliary tuberculosis following, apparently, upon hip-joint disease. The veins were, however, carefully examined, and no point of entrance of the tubercle could be found, and yet the numerous miliary tubercles showed that the infection had arisen through the blood channels. The heart showed a recently warty endocarditis, and upon the mitral valve, in addition to the ordinary fine translucent granulations characteristic of the acute endocarditis, there was a rough yellow nodule the size of a hemp-seed. Its structure showed a vascularised tissue, a form of granulation tissue with epithelioid cells, but no giant cells. Its free surface showed a number of irregularly-shaped necrotic areas, partly caseous and partly hyaline, in which appropriate staining methods demonstrated great numbers of tubercle bacilli. A zone fully half a millimetre thick consisted almost wholly of colonies of the bacilli. Benda is of opinion that this was the source of the general infection.

Myxoma of tricuspid valve.—Hugo Guth (*Prag. med. Wchnschr.*, 24th Feb. 1898) records a case of this nature. He refers to the rarity of cardiac neoplasms of all kinds, and finds that there are eighteen authentic cases of cardiac myxoma throughout medical literature, and he gives particulars of them. He considers his own case to have been a myxo-papilloma, and thus to have exactly resembled only two of the foregoing cases, namely, those of Ribbert and of Martinotti respectively.

In the former case the site of the tumour was also the tricuspid valve. In his own case there was a rapidly growing cancer of the stomach as well, and he had therefore to satisfy himself that the tricuspid tumour had nothing to do with this. He was able to do this, and was clearly of opinion that the valvular tumour was an innocent one. He finds that all these tumours are comparatively benign. The tumour was situated upon the auricular surface of the tricuspid valve, rather nearer the free than the attacked margin. It was almost the size of a bean, and of a greyish-red colour. It was thick at the summit, slightly constricted at its base, and of soft consistence, and of an obviously villous manner of growth. The structure showed a gelatinous matrix, mostly perfectly homogeneous, through which a number of fine fibres ran. The villous surface was covered by a well-developed endothelium. Staining reagents affected the matrix differently. It stained mostly a pale blue with hæmatoxylin, a bright red with eosin, and a rose-red or reddish-brown by Van Giessen's method. At the base of the tumour the fibres became continuous with the fibrous tissue of the valve. Fine blood vessels in scanty numbers were scattered here and there throughout it. It differed entirely in its structure from the fibrocellular appearance which an ordinary endocarditic vegetation presents, and, besides, there was no endocarditis elsewhere, so that the author concluded that the growth was a myxomatous neoplasm. He does not say, however, that he found any undeniable myxomatous cells, and, in their absence, the myxomatous nature of the growth may reasonably be challenged; for inflammatory growths may show fibrin threads and cells, which bear a fairly strong resemblance to myxomatous tissue.

THE BLOOD.

Chlorosis.—This is an evergreen subject. E. Grawitz (*Fortschr. d. Med.*, Berlin, 1898, No. 3) gives an interesting addition to its literature. He gives a critical review of recent publications. He considers it as settled that chlorosis is characterised by a low percentage of hæmoglobin with a relatively high number of red blood corpuscles; but he further considers that a relatively diminished mass of red corpuscles and a relatively larger proportion of plasma have much more importance in determining the cause of the disease. There is an absence of degenerative changes in the red cells, such as are so evident in pernicious anæmia, and also an absence of evidences of increased activity of the bone marrow, and of changes in the number and proportion of the leucocytes. He thinks, also, that the evidences of increased fluid in the tissues of the body are not to be neglected, including the œdema of the retina (Romberg), and the increased diuresis in recovery, pointed out by Van Noorden. He therefore looks upon chlorosis as the symptom of a general neurosis, in which many other symptoms arise through the anæmic blood. He ascribes the altered composition of the blood to a morbid function of the vasomotor nerves, which gives rise to polyplasmia, lymph congestion, and imperfect development of red blood corpuscles. Chlorosis is essentially a disease of puberty, older women with even marked neuroses being free from it, or having usually an ordinary anæmia. He thinks that the explanation of this may be that, at the time of development of the female sexual organs, the vasomotor nerves are especially disposed to disease, just as, in still earlier periods, the motor functions are prone to affection, as in chorea.

THE PARATHYROID GLANDS.

In our previous issue we referred to the articles on the parathyroid glands by Welsh, which had already appeared in the *Journ. Anat. and Physiol.*, London, for January of this year. A continuation of these articles has now appeared in the same journal, vol. xxxii. p. 380, and in the *Journ. Path. and Bacteriol.*, Edin. and London, May 1898, p. 202. The former deals at length with the anatomy of the glands in man, and the latter is an experimental study upon these glands in the cat. His conclusions regarding the characters, relation, and structure of the glands in man are based upon the examination of over forty cases, from earliest infancy to advanced age. He also examined those of other animals, such as the ox, sheep, rabbit, cat, and ferret, for the purposes of comparison. The number in man is as a rule four, there being two on each side. There is a tendency towards union of two glands, and also irregular distribution, and thus one may escape notice, unless careful search is made. They form thin, flat plates, of an oval or pyriform outline, and are sometimes attached to the thyroid by a distinct stalk. They most commonly measure 6 or 7 mm. in length, 3 or 4 mm. in breadth, and 1·5 or 2 mm. in thickness. The two glands on each side are quite separate from the thyroid, and cannot be distinguished as internal and external. They are better termed anterior-inferior and posterior-superior respectively. The latter is more definite in position, generally lying on the posterior œsophageal wall, above the level of the lower edge of the cricoid cartilage. In structure, each gland is completely invested by a definite fibrous capsule, which entirely separates it from the thyroid, with which there is never any continuity of tissue. Septa pass into the gland from the capsule. The gland tissue is essentially epithelial, being composed of two kinds of cells—1. The principal cells constitute the greater part of the gland. They are small with a large round nucleus. The protoplasm is homogeneous. They show at least four different types of arrangement—(*a*) A continuous uniform cell mass; (*b*) a continuous cell mass, interrupted at frequent intervals by vascular strands of connective tissue; (*c*) a series of anastomosing columns of cells in a vascular fibrous reticulum; (*d*) a group of small acini, each containing a small mass of colloid material in its lumen, and lined by a single layer of epithelial cells. 2. The oxyphile cells. They are large with a small nucleus. The protoplasm is granular. They are not present in every case. They also may show four different types of arrangement—(*a*) A uniform cell mass, sharply defined from the principal cells, and situated either deep in the substance of the gland, or immediately beneath its capsules; (*b*) a few columns of cells, which gradually mix with the principal cells; (*c*) isolated groups of a few cells, scattered among the principal cells; (*d*) a single acinus, lined by oxyphile cells, and containing a colloid globule in its lumen. The structure of the parathyroids is not unlike that of the anterior pituitary lobe, the two varieties of cell resembling the "cyanophile" and "erythrophile" cells of the pituitary; and, further, in both organs the cells may be arranged in the form of small acini, containing a central colloid globule. The structure of the parathyroids is totally unlike that of the thyroids, and in no circumstances can it be transformed into ordinary thyroid tissue. His experiments were twelve in number, and were in all cases performed on cats. He gives particulars of the procedure and the results, and comes to the following conclusions:—(1) Removal of all the four parathyroids in the cat leads to acute and severe symptoms, with a rapidly fatal issue, even though the thyroid be retained practically uninjured. (2) Removal of three parathyroids does not lead to death, but may cause transient symptoms, similar to those which result from removal of all the glandules; loss of two parathyroids does not produce any appreciable change. (3) Removal of the thyroid and some of the parathyroids may lead to death with acute symptoms, if only one parathyroid is left; but may not induce any obvious derangement, if two parathyroids are retained, at least not for several months. (4) Mouth administration of the fresh parathyroid of the ox has no effect, either in mitigating the symptoms, or in averting death, after removal of the thyroid and parathyroids in the cat, even though relatively enormous doses are given.

TYPHOID FEVER.

Atypical typhoid fever.—Nichols and Keenan (*Montreal Med. Journ.*, Jan. 1898, p. 9) relate the following case of a patient who died of typhoid fever, in whom no lesion was found in the intestine. He had suffered for two months from headache, loss of appetite, and general weakness. On admission his temperature was 103°·6, pulse 104, and respirations 36. The tongue was coated and dry, the abdomen distended, tense, and tender. Fading rose spots were visible, and the spleen was palpable. The bowels were constipated, and there was some impairment of the percussion when in the left axilla. The blood serum gave the typical Widal reaction. He got gradually worse, and died thirteen days after admission. Blood cultures taken before death were negative. At the post-mortem the spleen was dark red and pulpy, and cultures from it yielded the typhoid bacillus. There were no ulcers in the intestine, and none of the Peyer's patches were even swollen, except the last three in the ileum, which were slightly raised. There was no evidence of any healed typhoid ulcers. The mesenteric glands were generally enlarged and congested, especially about the ileo-cæcal region. The left lung showed broncho-pneumonia. Cultures were also taken from the liver and from the blood; the former yielded the typhoid bacillus, but the latter were negative. They examined the literature of the last ten years, and find only other nine similar absolutely reliable cases. A far greater number of cases of atypical typhoid has been recorded. Schaltz gives twenty-one cases, but they reject all in which the diagnosis was not confirmed by the recognition of Eberth's bacillus. They group the cases clinically in three main classes:—(1) Typical typhoid, minus ulceration; (2) spleno-typhoid; (3) nervous cases with extreme intoxication. Examples of the first type are rare. Diarrhœa may be present. Three of the nine cases belong to this group. The second type was first described by Eiselt. It is characterised by an excessively enlarged spleen, often with acute perisplenitis, and fever of a recurrent type. Two of the nine cases belonged to this group. The third type is characterised by extreme prostration, delirium, coma, sometimes hyperpyrexia, degenerative changes in the vascular system, leading to purpura, hæmaturia, melæna. Jaundice is sometimes present. This includes the rest of the nine cases, including the one the writers report. They discuss the possible explanations for the absence of ulcers in the intestines, and suggest, first, the possibility of infection through some other channel than the intestine, *e.g.* the respiratory tract. In such cases, the brunt of the disease might fall on the lungs. Second, the production of locally immunising substances in the bowels, the result of the action of the bacillus of Eberth or some accompanying form.

Post-typhoid fever.—J. M. Da Costa (*Phila. Med. Journ.*, Jan. 1898) refers to cases often met with after an attack of typhoid fever, in which the temperature rises again after it has become normal, and then follows an uncertain period of pyrexia. He suggests the name post-typhoid fever for the condition. It is not a true relapse, as it is continuous, or nearly so, with the original fever, and does not come, like a true relapse, on after an interval of ten days or more. The fever is moderately continuous, and usually lasts eight to ten days, sometimes longer, and does not show marked remissions. Other disturbing local conditions, such as phlebitis, periosteal lesions, local pleurisy, nephritis, otitis, bed-sores, boils, constipation, unhealed ulcers with diarrhœa, or a dysenteric state, must be excluded. There are no other symptoms than the fever, no fresh eruptions of spots, enlarged spleen, or diarrhœa. In some cases a transient rise of temperature may be caused by an indiscretion of diet, but the frequency of this cause has been overrated. Mental emotion may also cause a rise; but, eliminating all these conditions, there yet remains to be explained cases coming on during an attack of typhoid, in which everything else points to convalescence, when fever springs up unaccountably, and remains for a time. This need not alarm the patient or his friends, as it is not serious. Da Costa thinks it is probably neurotic, and to be explained by the heat centres being badly nourished, and hence in an unstable condition; a fever habit being established, which is not easily shaken off. It is generally cured by cautiously and rapidly improving the diet, by giving easily assimilated tonics, and by getting patient out of bed as soon as possible.

On the presence of the typhoid bacillus in the urine.—Mark Wyman Richardson (*Journ. Exper. Med.*, N. Y., May 1898) gives the result of a careful examination of thirty-eight cases. He summarises the results of previous workers as follows—(1) Typhoid bacilli are present in the urine in 25 per cent. (2) When present, it is in large numbers, and, in great majority of cases, associated with albumin. On the other hand, a considerable amount of albumin may be present without bacilli. (3) Are seen generally in later stages of the disease, and may persist for a considerable time into convalescence. In his own observations the glans penis was cleansed with a solution of corrosive sublimate, 1 to 1000, and the urine then passed in two portions into sterilised tubes. The second part only was used. The urine was plated as soon as possible upon plain agar. Examination was made after eighteen to twenty-four hours in an incubator. He came to the following conclusions—(1) The bacillus was present in nine out of the thirty-eight (about 25 per cent.); 172 specimens having been examined, with forty-four positive results. (2) The numbers of the bacilli were always large, each loop of urine harbouring thousands of the germs, practically a pure culture. (3) They appeared in the later stages of the disease, and then persisted far into convalescence, in one case ten days after the discharge of the patient. This is of much importance from a public health point of view, and it is obvious that the urine must be disinfected, not only during the disease, but also during convalescence. (4) The germs were practically always associated with albumin and renal casts; though in nearly all the cases the amount of albumin was small, in one case only reaching $\frac{1}{8}$ per cent. The albumin may persist after the disappearance of the bacilli. On the other hand, considerable amounts of albumin, and casts in large numbers, often show no bacilli. (5) Irrigation of the bladder with antiseptic solutions offers a possible means of removing permanently the bacillus from the urine. It seems probable that their multiplication takes place in the bladder, but the post-febrile polyuria seen in this disease is not of itself sufficient to remove them.

DERMATOLOGY.

UNDER THE CHARGE OF

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Verruca Plana Juvenilis.

Djamdjieff (*Trav. Clin. de Dermat. de Bordeaux*, 1896–97) in an exhaustive article again directs attention to this. Thin seems to have been the first, in 1881, to have published a characteristic instance, but the essential features which separate it from verrucca vulgaris, also an affection of youth, are now well established. The name we owe to Besnier. It has been found on the dorsum, and, less frequently, on the palm of the hand, on the wrist, forearm, face—especially on the forehead and cheeks—on the scalp and neck, and, though rarely, on the scrotum, leg, and anal fold. In most of these situations it forms a small circular elevation, from 1 to 5 mm. in diameter. In colour it may be dull rose, fawn, or brownish, occasionally distinctly yellow, almost resembling xanthoma, or it may hardly differ from the natural tint of the skin. It is very little raised above the surface, yet is quite perceptible to the eye, owing to its sharply defined contour. There is no thickening of the skin on palpation. It is smooth, soft, somewhat shiny, or finely granular, and it may desquamate a little as dust or in minute scales. There is no areola, though there may be an epidermic collarette. The individual elements tend to group themselves into very irregular patches, interrupted by folds. There are no subjective sensations as a rule; slight itching may sometimes be complained of. On the palm the aspect is different and peculiar. The smallest, those not larger than a pinhead, appear as a perforation of the horny layer, not unlike the worm-eaten spots seen on the hands of washerwomen. The margin is sharp; the floor, only a fraction of 1 mm. deep, is flat, horny, and finely granular, in which the apices of the normal papillæ are no longer distinguishable. In the larger, the bottom of the depression is irregular and scaly. There is no thickening under the lesion, perceptible to touch. On the scalp the flat warts give off an abundant branny desquamation. The duration is long. Only a few may be present on the hands, or a slow progressive increase may occur during the course of years. Sometimes the point of departure is a mother wart, or a group which for a time had existed unchanged. Scratching seems one element in propagating them. In a case reported by Gémy, a man of 30 had a few flat warts on the scrotum and near the anus. In a couple of weeks a sudden extension occurred, apparently due to the scratching caused by an infection with the pediculus pubis. As to the etiology few facts are available. Most common between 10 and 20, it has been seen at 1 year and 5 months, and as late as 37. Neither contagion nor a parasitic nature can be proved. It is quite distinct from verruca vulgaris, though the diseases have been met with co-existing; indeed verruca vulgaris has been seen growing on verruca plana. Anatomically it is constituted by a hypertrophy of all the epidermic layers; the derma does not show any change special to it. The lesion is an acanthoma, and there is thickening of the spinous and granular layers, but the budding downwards of the prickle layer is much less pronounced than in verruca vulgaris. The granules of kerato-hyaline are found solely in the neighbourhood of the nuclei, while the eleïdin is diffused throughout all the thickness of the horny layer. The diseased parts are sharply defined from the normal integument. In diagnosis one must distinguish it from verruca vulgaris, verruca senilis, and lichen planus. Confusion with verruca vulgaris is only possible on the back of the hand. Verruca vulgaris is as a rule less numerous, and has less liability to become aggregated into groups. It is both more prominent and more deeply implanted. The surface is irregular and splits perpendicularly, imparting the appearance of a short brush, from which ragged blocks break off, not horizontal plates or scales. Verruca senilis is seen on the trunk or limbs of adults or old people. It is rare on the face, where one finds rather the keratoma senile. On the hands they form small elevations, flat or finely granular, greyish or brownish, but in general close examination reveals some blackish epidermic globes embedded in the derma. On the trunk these are better known as seborrhœic warts—round, soft, black projections—covered by a thick investment of greasy scales, on removing which an unequal surface is exposed. In lichen planus there is always more or less pruritus, the papules are harder, polygonal with shiny tops. In verruca plana the elements when active show slight pigmentation; in lichen planus, on the contrary, pigmentation appears during retrogression. It is rare, too, to find lichen planus on the back of the hands alone; it hardly ever is seen on the face. In treatment, arsenic internally seems to have benefited a number of cases, and has cured verruca plana without influencing verruca vulgaris, simultaneously present. Feulard cured a case by washing with salicylic soap, followed by a lotion containing carbolic acid, salol, and corrosive sublimate.

On the Action of Alternating Currents and Currents of High Tension in Diseases of the Skin.

Oudin (*Monatsh. f. prakt. Dermat.*, Hamburg, 15th Feb. 1898) refers to the high therapeutic value which has been assigned to Franklinisation in various skin affections. These favourable results have by some been believed due to the changes effected by static electricity on the general condition of the patient, by increasing nutrition, promoting combustion, improving assimilation, and lessening opportunities of auto-intoxication. Others have laid more stress on the local action of the current as a parasiticide, as exerting a trophoneurotic action, or as generating ozone. But the fact remains that its beneficial influence in eczema and ulceration of the skin is no longer denied. These good results are attained more rapidly and completely with currents which quickly alternate. As this method of rapid alternation is a thing of comparatively recent introduction, Oudin enters into an elaborate description of the apparatus employed, which appears rather complicated, but is not so, he says, in reality. As electrodes he uses either a glass cylinder or a metallic brush. He prefers the latter in chronic diseases without inflammatory reaction, as psoriasis and dry eczema; the glass electrode in the irritable and inflammatory forms, as in acute eczema and on specially tender parts. He commonly employs two or three applications weekly, never exceeding the duration of ten minutes as the extreme in each. The effects are first local anæmia, with erection of the follicles, succeeded by reddening, which extends beyond the point of application. Subsequently there is a sensation of warmth and local comfort. Occasionally small beads of sweat form. A number of cases are recorded, in most of which much, in some very striking, benefit resulted. A marked effect is produced on the nerve terminals, as is proved by the speedy cessation of itching.

Diffuse Scleroderma.

Osler (*Journ. Cutan. and Genito-Urin. Dis.*, N. Y., Feb. and March 1898) takes up some of the relationships of this complaint from a study of eight cases. Referring to the general features, he draws attention to the not uncommon onset with arthritis. An association with Graves's disease has occasionally been observed, and in one of his cases the scleroderma appeared soon after the Graves's disease, and did not progress. The diagnosis is important. It must sometimes be distinguished from brawny, solid œdema, met with at times in patients with long-standing renal or cardiac disease, in which there is induration following chronic dropsy. From scorbutic sclerosis he thinks there should be little difficulty. In such there may be parchment-like immobility of the skin, due to extensive subcutaneous hæmorrhages, involving the muscles. In the stage of swelling, or infiltration of the skin, it may resemble myxœdema. There are, too, vasomotor and trophic affections, such as Raynaud's disease, which may cause confusion, as the erythema, the infiltration, the pigmentation, and extreme cyanosis are not wholly unlike. This increase in the pigment may suggest Addison's disease, since the bronzing may be extreme. Finally, he carefully discusses the treatment by thyroid gland extract, and concludes that his personal experience, and the results as recorded by the literature, do not encourage treatment by this method. It may be tried without harm; should it fail, frictions and salicin preparations should be used.

ERYTHEMA INDURATUM.

The true nature of the peculiar reddish nodosities, prone to ulcerate, which are occasionally met with on the lower limbs of females, usually young, whose occupation necessitates much and constant standing, but who present the clear complexion and the plumpness associated with the scrofulous diathesis, has so far not been thoroughly explained. Audry of Toulouse (*Ann. de dermat. et de syph.*, Paris, March 1898) has made a careful study and examination of a typical case, and concludes "that after a histological and bacteriological survey of the lesions of erythema induratum of Bazin, there is nothing to authorise us to attach it directly to tuberculosis. The histological appearances seem to be due to fatty degeneration, which develops ulteriorly on regions affected with a considerable and spontaneous œdema. The inflammatory signs are there reduced to a minimum." How and why, therefore, have all authors who have treated of this disease classed it among the disorders connected with scrofula, struma, or lymphatism? The unanimity proves that there are characteristics which ally it with those ailments. Of those mentioned he prefers to unite it with lymphatism, and not with scrofula. "If one, hypothetically, desires to be more precise, the original view of Hardy seems to be the best,—that the erythema induratum of Bazin is but a chronic, and occasionally ulcerative, variety of erythema nodosum."

MYCOSIS FUNGOIDES.

Whitfield (*Brit. Journ. Dermat.*, London, May 1898) records a well-marked case. A man of 64, with a doubtful family history of the same complaint, had good health till four years before coming under observation. General scaliness, accompanied by slight itching, commencing on the scalp, was the first symptom, followed three years later by the appearance of tumours, most of which broke into sores. When seen, an almost universal eruption affected him. This was like psoriasis, casting off thick silvery scales. The circles and curves, however, on close inspection consisted of moderately firm nodules of a darkish red colour. In places these were grouped into patches, covered with a thick greasy scab, under which was more or less ulceration, partly invested with an offensive greyish film. He was feeble and suffered from fever of a hectic type. On microscopic examination, the appearances closely corresponded with those described by Unna, yet his description and the course of the disorder hardly applied. No micro-organisms were to be found. Negative evidence is valuable, since, if any of the hitherto described organisms is to rank as the cause, it must, at all events, obey the first of Koch's laws, namely, it must be demonstrable in every case of the disease. The case was one which exhibited the very marked desquamating stage, the so-called lichenoid or eczematous period, with little tendency to the formation of actual tumours. Whitfield points out that it is very important for investigators to define the variety they report, since it is possible that different causes may be at work in cases like his, and in those in which there are tumours from the commencement. Shoemaker (*Journ. Amer. Med. Ass.*, Chicago, 16th April 1898) relates a case in a woman of 60, who had suffered rather more than four years. The earliest manifestation consisted of red patches situated on the back, and accompanied by intense itching. When seen, little of the surface was unaffected. There were patches of a bright red colour, somewhat elevated, and prominent outgrowths, some vivid, some dark red, which often bled, being torn as a result of the incessant pruritus. Death occurred a year later. There is no mention of any search for organisms. The microscopic appearances differed in some respects from those usually found, since the mass of the tumours was made up of epithelial cells, with a vascular connective tissue stroma. Though more suggestive of cancer, this view was rejected by Shoemaker himself, and by other dermatologists who discussed the case, all accepting it as one of mycosis fungoides.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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Glandular Fever in Children.

Under this heading E. Pfeiffer has described, in a recent paper, an acute glandular condition in children, which has hitherto been unrecognised, and which he contends ought to be regarded as one of the specific fevers.

The illness commences suddenly in children between the ages of 2 and 4, with coated tongue, vomiting, headache, abdominal pain, and rapid rise of temperature. These symptoms are accompanied by tenderness in the anterior triangle of the neck, and by stiffness and pain on movement of the head. There is usually some pain on swallowing, but there is never during the whole course of the illness any pharyngitis or tonsillitis. Generally, two or three of the lymphatic glands, under the anterior edge of the sterno-mastoid, enlarge to the size of a walnut, and are acutely painful on pressure. They remain in this condition for two or three days, during which time the temperature continues to rise, sometimes reaching 104° F. Gradually the glandular enlargement subsides, till, by the end of two or three weeks, complete resolution takes place, suppuration never occurring. The temperature falls by lysis, accompanying the subsidence of the glandular swelling; almost invariably the glands attacked are those on the left side of the neck, but occasionally, after they have subsided, the glands on the right side become affected in an exactly similar manner. In a large proportion of the cases there is a palpable enlargement of the spleen and liver. The enlargement of the gland is a distinctly idiopathic condition, there being neither tonsillitis, eczema capitis, otitis, nor dental caries to account for it. The disease is sometimes mistaken for mumps on superficial examination, but the swelling in the cases described is confined to the glands under the sterno-mastoid, the parotid gland remaining quite unaffected. Further, an attack of mumps renders the patient immune from further attacks, whereas many of the patients suffering from glandular fever have previously passed through an attack of parotitis.—*Jahrb. f. Kinderh.*, Leipzig, Bd. xxix. S. 257.

ARTHRITIS IN CHILDHOOD.

In this paper, after describing the various arthritic changes, caused by acute and chronic rheumatism and the specific fevers, Dr. Still gives an interesting account of arthritis in childhood, arising from primary sources of infection. These sources he considers are more widespread than is generally supposed, and the starting-point may even be found in a severe otitis media, or in an empyema; septic processes in the lung are, as is well known, frequently associated with cases of arthritis, which may be quite transient in their course; and the author describes cases of arthritis, occurring in children suffering from bronchiectasis, which developed quite suddenly with a little fulness, stiffness, and tenderness about one or more joints, and in a few days completely recovered. Instead of this favourable termination by resolution, there may occur permanent thickening and adhesion of the joint, with any degree of fixation, up to almost complete fibrous ankylosis, or it may end in suppuration and complete disorganisation.

The one feature which is common to this whole group of septic arthritis is, that the affection is a sudden flare-up, which, although it may last a considerable time, is not a progressive condition, but burns itself out and leaves only its traces behind. In the disease known as post-basic meningitis there often occurs a swelling of one or more joints, which has all the appearance of an arthritis; but if the joint is cut into in these cases, it is found to be perfectly healthy; but a lymph-like exudation surrounds the tendon sheaths in the neighbourhood of the joints and round the capsule. Until quite recently this affection was unknown, but it has been shown conclusively that it is due to a local infection by the same micro-organism which produces the meningitis, namely, the diplococcus of basic meningitis.

In concluding his paper, the author refers briefly to the syphilitic joint affections which one meets in children, which are usually painless, and limited to one joint or to two symmetrical joints. In two cases he met with a condition bearing a strong resemblance to Heberden's nodes, in children suffering from congenital syphilis; and in one boy, suffering from the same disease, well-marked bony thickening and lipping about the joints occurred, very similar to the rheumatoid arthritis of adults. These conditions are of gradual onset, and are hardly likely to be confused with rheumatism, owing to other evidences of congenital syphilis, and to the absence of the usual rheumatic symptoms.—*Clin. Journ.*, London, 23rd March 1898.

THE PSEUDO-PARALYSES OF CONGENITAL SYPHILIS.

This paper deals chiefly with the morbid appearances revealed by a post-mortem examination of a 15 days old syphilitic child, who during life had developed pseudo-paralysis of both arms, more marked on the right than on the left side. The examination of the spinal cord in this case goes far to combat the generally accepted theory, that those pseudo-paralyses do not owe their origin to a central lesion, but are myopathic affections, entirely due to a relaxed state of the muscles, or to a hyperæsthetic condition of the epiphyseal cartilages.

Along the upper part of the spinal cord, chiefly, however, in the cervical portion, there existed a well-developed spinal meningitis, with marked thickening of the pia mater, which in places adhered to the cord. This meningitis of the cord was more intense on the right side posteriorly, than on the left side and in front.

On cutting into the cord, a well-developed degeneration of the posterior nerve-roots was observed, also more advanced on the right than on the left side of the spinal column. Other finer lesions of a secondary nature were found in the posterior cervical and dorsal segments of the cord. There was also present, though in a lesser degree, a degeneration of the anterior nerve-roots, both in the cervical and lumbar segments. The microscopical examination of the brachial plexus on the right side revealed some degenerated fibres, which fibres are to be regarded as a descending degeneration, consecutive to that present in the anterior nerve-roots. In consideration of these morbid conditions, the author concludes that the paralysis of the arms was due, not, as is usually maintained, to a painful condition of the muscles or bones, but to anatomical lesions of the spinal cord.—*Jahrb. f. Kinderh.*, Leipzig, 1898, Bd. xlvi. S. 347.

Two Cases of Measles with Septicæmia.

The two cases which the author publishes refer to a boy of eleven months, and to another of two years and a half, who both succumbed during the third or fourth day of an attack of measles, without developing any of the complications which are usually the cause of a fatal termination in that disease. In the first case, the only lesion found at the post-mortem was very slight congestion of the lungs. The bacteriological examination of the blood, taken from a vein in the elbow, revealed a very large number of streptococci, which were also demonstrated in the substance of the tonsils, the lungs, the kidneys, and the spleen. In the second case the blood also contained numerous streptococci, but the microscopical examination of the different organs only revealed the presence of the micro-organisms in the tonsils. Inoculations made from pure cultures gave rise to only slight reactions. According to the author, these two children succumbed to a general infection by streptococci, the door of their entrance into the system being through the tonsils.—*Jahrb. f. Kinderh.*, Leipzig, 1898, Bd. xlvi. S. 49.

Pneumonia in Childhood.

Aufrecht considers that the terms lobular and lobar pneumonias are often misleading, as applicable to the conditions known as catarrhal and croupous pneumonias, for many cases of the catarrhal type undoubtedly assume a lobar distribution.

As a rule, a croupous pneumonia assumes what may be regarded as an ascending course, whereas the catarrhal form has many foci of origin. In the croupous variety, in the first instance, there is a congestion of the alveolar capillaries, whilst, according to Ziemssen, Bartels, and Damaschino, the congestion is confined to the mucous membrane of the bronchial tubes in the catarrhal form. Hæmorrhages are frequently found in the bronchial mucous membrane, in these cases extending as far as the adventitia, so that we may regard the hyperæmia as having an inflammatory origin. In croupous pneumonia we find exudation of white and red blood corpuscles from the capillaries, followed by brown hepatisation. On the other hand, in catarrhal pneumonia the exudation of the blood corpuscles and proliferation of epithelium starts in the bronchioles, and spreads to the alveoli.

The author does not regard the bacterial theory of the origin of the disease as at all sufficient to account for many of the cases which occur.

He divides catarrhal pneumonias into the three following groups:—

1. Primary pneumonias, which occur in older children not suffering from any of the exanthemata.

2. Pneumonias following the infectious diseases, and accompanied by inflammation of the mucous membranes, met with especially after measles, whooping-cough, and diphtheria, and which are especially liable to undergo cheesy degeneration and end in tuberculosis.

3. Pneumonias occurring in badly nourished children, due to bad air and insufficient and unsuitable food.

In the first group we encounter high fever, whilst in the second the fever is long-continued, and interrupted by remissions, whereas in the third and last division fever is often altogether absent.—*Kinder-Arzt*, 1897, Bd. viii. S. 220.

Disease of the Spinal Cord complicating Whooping-Cough.

Amongst the sequelæ of whooping-cough certain cerebral disturbances, such as hemiplegias, mental disease, and affections of the cerebral nerves, are of frequent occurrence. Rarely, however, do we meet with affections of the spinal cord, as occurred in the following case described by Professor Bernhardt. A little girl, five years of age, suffering from whooping-cough, was seized, after a severe paroxysm of coughing, with sudden paralysis of both legs, accompanied by stiffness of all the joints. There was neither fever, sensory disturbances, nor convulsions. Four weeks later examination disclosed spastic paralysis, increased tendon reflexes, and some slight paralysis of the bladder. Under the influence of rest, baths, and iodide of potassium, improvement took place, and at the end of three years the child was nearly well, with the exception of a little stiffness in one leg, and rather frequent micturition with occasional pain.

Bernhardt believes this case to have been an acute myelitis of the lower dorsal and lumbar regions, and not, as we would be more inclined to expect, after whooping-cough, a hæmorrhage within the cord. He considers that if the paralysis had been due to a hæmorrhage, it would have been accompanied by grave bladder and rectal symptoms, by well-marked sensory disturbances, and by the loss of tendon reflexes.—*Wien. klin. Wchnschr.*, 1897, Bd. x. S. 68.

REPORTS OF THE MEDICAL SOCIETIES.

Edinburgh Medico-Chirurgical Society.—Clinical Meeting, 18*th May* 1898.—Dr. James Carmichael in the chair.—Dr. Affleck showed two cases of tubercular peritonitis after surgical treatment—one with phthisis and pleural effusion.

Sir Thomas Grainger Stewart showed a case simulating Thomson's disease. Mr. Alexis Thomson showed a depressed fracture of the skull, with localised paralytic symptoms affecting one arm and the muscles of deglutition. Dr. James showed a patient with aortic disease. Pulse tracings showed a double apex, in his opinion, due to asynchronous contraction of the ventricles. Dr. G. Elder showed—(1) Congenital absence of the radius and thumb, with deficiency of the lobe of the ear on the same side; (2) rheumatoid arthritis in a girl. Mr. Cathcart showed—(1) A child after excision of intussuscepted bowel; (2) patient after operation for ruptured tubal pregnancy. Dr. Gibson showed—(1) pseudo-tabes syphilitica; (2) tricuspid and mitral disease, showing two distinct presystolic murmurs. Dr. J. Carmichael showed pseudo-hypertrophic paralysis. Dr. Dawson Turner exhibited stereoscopic Röntgen photographs, and demonstrated an experiment relating to subjective colour phenomena. Dr. Graham Brown, for Dr. M'Gillivray, showed a uterus with fibroids from a case of abdominal hysterectomy. Mr. Cathcart showed a specimen of multiple gastric ulcers. Dr. Gibson showed —(1) Drawing of Addison's disease; (2) a very large gall stone; (3) a Röntgen photograph of transposition of the viscera, which Dr. Macintyre had kindly taken for him. Dr. R. A. Fleming showed naked-eye and microscopic specimens from Dr. Gibson's case of Addison's disease.

1*st June* 1898.—Dr. James Carmichael, President, in the chair.—Dr. Bruce showed—(1) A chondrophasia, with cast and photographs; (2) congenital dislocation of the right scapula. Dr. Norman Walker showed—(1) Lichen scrophulosorum; (2) peculiar bald patches on the head, probably a case of folliculitis decalvans. Dr. A. Bruce showed —(1) An aneurysm of the anterior communicating artery, with rupture into the lateral ventricle of the brain; (2) an aneurysm of the internal carotid, which had led to subdural hæmorrhage; (3) specimen of *diabète bronzé*; (4) arterial sclerosis in the basal ganglia, causing cerebral hæmorrhage; (5) arterial sclerosis and miliary aneurysm in the medulla; (6) encysted subdural hæmorrhage. Dr. N. Walker showed section of lupus erythematosus and of acne. Dr. Harvey Littlejohn showed—(1) An infarction of the left coronary artery; (2) suicidal cut throat; (3) an extra-uterine pregnancy in the uterine wall; (4) tracheal wound in a case of recovery from cut throat, and the healed wound in a case of tracheotomy.

Mr. A. G. Miller then read his paper on acute and chronic myositis He referred especially to the causation, and suggested that the state of the barometric pressure might influence the etiology. Under the head of treatment, he mentioned that he mainly depended on actæa racemosa, with massage and movement of the affected part.

Mr. Alexis Thomson read a paper on experiences of enlarged prostate, which will appear shortly.

Edinburgh Obstetrical Society.—*8th June* 1898.—Dr. Milne Murray, Vice-President, in the chair.—The Chairman proposed that the meeting should be adjourned out of respect for and sympathy with the President, Dr. Halliday Croom, in his sad bereavement. The motion was unanimously adopted.

Forfarshire Medical Association.—The Annual Meeting of the Association was held at University College, Dundee, 9th June 1898.—Dr. Alex. Campbell, President, in the chair. Dr. Byrom Bramwell read a paper on pernicious anæmia. Drs. Sinclair, J. W. Miller, Mackie Whyte, and others joined in the discussion which followed. The President thanked Dr. Bramwell, in the name of the Association, for his interesting paper. Drs. Rorie MacEwan, Fraser, and others showed some interesting specimens and photographs in the chemical laboratory. The members afterwards dined together.

MEDICAL NEWS.

Medical Practice in Italy.

There has been a strong effort in Italy to obtain, if possible, the passing of a law to prevent British medical men from practising in Italy, even amongst their own countrymen, unless they possessed a diploma from one of the Italian Universities.

The Edinburgh Senatus prepared a memorial in support of the existing conditions under which British graduates in medicine practise in Italy, and this was submitted by Lord Balfour of Burleigh to H.M. Secretary for Foreign Affairs. A communication has now been received from the Foreign Office, that it has "been decided not to alter the existing law relative to foreign doctors in Italy."

Lord Lister.

With imposing ceremonial, the freedom of the city of Edinburgh was conferred upon Viscount Wolseley and Lord Lister, in the M'Ewan Hall, on Wednesday, 15th June, in the presence of a large and representative gathering. Lord Lister was welcomed on revisiting the scene of so much of his life work with unbounded enthusiasm, not merely by those who were the guests of the corporation, but by an immense concourse of undergraduates, who testified their admiration and reverence in unstinted measure as he left the University precincts. The President and Fellows of the Royal College of Surgeons held a reception in his honour on Thursday, 16th June, and in the evening Lord Lister presided at the annual dinner of the Residents' Club.

Colonial Medical Service.

The Director-General, Army Medical Department, has intimated that appointments in the West African Service are again open.

THE SIXTY-SIXTH ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

During this month the grey metropolis of the North will welcome the members of the British Medical Association to what assuredly should prove a memorable meeting—the largest medical association in the country, holding its annual meeting in the largest Medical School. One who has been born and bred amid the picturesque, romantic surroundings of Edinburgh, although doubtless fortunate in his natal lot, is unable to appreciate the beauties of the city to the same degree as a stranger. Apart altogether from the professional aspect of the meeting, the city's undoubted beauty, her picturesque situation and environment, the grace of her buildings, and the panoramic views obtained from the summits of her hills, or even from the pavements of many of her streets, rich in chiaro-oscuro and distance—*pace* the chill advent of the "eastern haar"—cannot fail to add much to the success of any meeting held in our "Modern Athens." However profound be the matters discussed, or learned those who discuss them, no meeting is unattended by a generous proportion of play-time, to counterbalance the effects of abstruse thought and scientific debate. Edinburgh can not only promise exceptional facilities for the reception and entertainment of her guests within the city, but can offer them an unusual number of highly-interesting excursions by road, by rail, and by sea.

The Edinburgh School of Medicine is famous, but we believe that many medical men do not sufficiently appreciate what the School has accomplished, remembering that even now the inhabitants of Edinburgh only number about 300,000, or about 7·5 per cent. of those in London; while at the end of last century the number of residents reached a figure which to us nowadays appears to be most meagre. Notwithstanding this, few single schools have produced so many masters. Black, who when twenty-four years of age apprised the world, in his graduation thesis, of the discovery of "fixed air," now known as carbonic acid gas. Cullen, of extraordinary genius, foresight, and orderliness of mind, the final vanquisher of that slavish empiricism, modelled upon the laws of his great prototype, Galen (of as original a mind in his time), whose fanciful classification and comprehension of diseases the poor-spirited, unambitious professors of the healing art, the barbers and chirurgeons of mediæval times, were content to follow for more than a thousand years. Cullen overturned the recent work of Boerhaave by showing that the nervous system formed one of the necessary vital agents—a system which had up to that time been ignored. Cullen was one of the founders in 1737 of the ancient Royal Medical Society, in whose hall most valuable portraits of himself and of Black may be seen. The Royal College of Physicians also possesses a portrait of Cullen, and a great number of his manuscript letters and lectures; while the Royal Infirmary Library contains

[illegible]

making the acquaintance of fellow practitioners on another footing [illegible] that of the sickroom or ward; while they form the lineal descendants of the more bacchanalian clubs of last century. This custom has led to the discovery from time to time of very considerable lyrical talent among the members, and few of the clubs were or are unprovided with a *cantor primarius*, a poet-laureate or topical rhymster, who was or is able to render the post-prandial proceedings more interesting and amusing. In fact, a volume of "College Lays" was published a few years ago containing several of these occasional and generally topical songs. Among those best known in this respect were the late Drs. Sidey, J. D. Gillespie, and Andrew Wood; Sir Douglas Maclagan, Dr. John Smith, Sir John Batty Tuke, Dr. A. P. Aitken, and others. Nothing can serve to banish professional jealousy and to conserve the tone of medical etiquette so successfully as such societies; and it is probably in large measure due to them that the members of the profession in Edinburgh are able to point to the fact that there can scarcely be more good fellowship between medical men in any other district or city than in their "ain romantic toun."

Since the British Medical Association was founded in 1832, under the name of the Medical and Surgical Association, its members have twice availed themselves of the hospitality of the citizens of Modern Athens. This month, the members of the medical profession and the citizens of Edinburgh will welcome the Association for a third time, a task which for magnitude will much exceed in amount of work the preparation and arrangements called for on the previous occasions. It is, however, gratifying and reassuring to reflect that, while the number of Associates has increased enormously, a proportionate enlargement of the Edinburgh Medical School has taken place, so that it is as well fitted for the adequate reception of the invading but friendly host as it was for the entertainment of the visitors of 1858 or 1875. In 1858 the total number of members forming the Association barely reached 2000; in 1875 their number attained 6112; while at the present time the corresponding figure is well over 20,000. In 1858, the list of those attending the twenty-sixth meeting, on the 29th, 30th, and 31st of July, only contains 170 names, twenty-nine of which are of local practitioners, only 141 those of visitors. Among the twenty-nine belonging to Edinburgh who took part forty years ago in the business of the meeting, seven still remain,—Professor Sir W. T. Gairdner, Emeritus-Professors Sir Douglas Maclagan and Sir John Struthers, Professor A. R. Simpson, Dr. Patrick Heron Watson, and the present doyens of the profession in the city, Drs. Moir and Peddie. America supplied one, William Gibson, M.D., Philadelphia (the author of "Rambles in Europe in 1839, with Sketches of Prominent Surgeons, Physicians, etc.," Philadelphia, 1841), of the total; Antigua, one; the remainder belonged to Great Britain, among them the original founder of the Association, Sir Charles Hastings of Worcester. These numbers, to quote the journal of the Association, were "imposing," and, as it further says, "the splendour of this meeting has justified the assumption of the title 'British'; and we have found that, by enlarging the horizon, we have also enlarged our numbers, influence, and means."

The total number of the members of the Association given in the official list for 1858 as resident in Midlothian is twenty-six, truly a small number to represent "the most renowned seat of medical learning" (*Brit. Med. Journ.*, London, 1858, vol. ii. p. 605), and to entertain the Association. Among the twenty-six, however, were many of weight—William Pulteney Alison, Emeritus Professor of Medicine in Edinburgh University, who delivered the inaugural address, based chiefly on "progress"; Professors James Young Simpson, Robert Christison, James Miller, J. Hughes Bennett, and Laycock. The address in therapeutics was delivered by Professor Christison, in midwifery by Professor Simpson, and in surgery by Professor Miller. History repeats itself. Professor Miller in his address expressed his suspicion with regard to the effects of chloroform on the general health, recommended its use in children, in major operations upon adults, but advised his hearers to be slow to humour a patient's fancy in operations less severe than amputations, lithotomy, hernia, etc., or even in milder operations, if only used "to quiet his unnecessary alarm." Already the controversy between the advocates of ether and those of chloroform had commenced. Professor Miller in his address maintained towards this question the wise position which may be styled one of "philosophic doubt."

In 1858 the present plan of arranging the discussion of technical subjects into different sections had not been introduced; it was not until nine years later, in 1867, that the individual grouping of subjects was first adopted at the annual meetings.

The members of the Association met at four o'clock on Thursday, 29th July 1858, in Professor Forbes's class-room in the Old University Buildings (probably the natural history class-room)—a M'Ewan Hall was not required at that date.

In the evening, after a protracted general meeting, a conversazione was given to the members by the Royal College of Surgeons in their Museum, where three-quarters of an hour was profitably spent in examining the specimens, and about the same period of time in listening to an address by Dr., afterwards Professor, W. Sanders, upon the more interesting pathological items in the collection, after which "the usual refreshments," and then to bed; hardly a modern interpretation of the word conversazione. After transaction of ordinary business on the second day, the Royal College of Physicians gave a very similar entertainment to that of the sister college. On the third and last day of the meeting a number of the members breakfasted with the Edinburgh Medical Missionary Society at 8 A.M.; the business of the meeting was afterwards brought to a conclusion, a visit paid to the Botanical Gardens, and at a later hour the annual dinner held in the Hopetoun Rooms, Queen Street—Professor Christison in the chair. It is officially recorded that Sir Douglas Maclagan on that occasion sang of the merits of "plain cold water," to the great amusement of his auditors.

The meeting of 1858 was held at a time when very important matters concerning the medical profession in Great Britain were in progress, or had just been adjudicated upon. During the course of the conversazione at the Royal College of Physicians a dramatic incident occurred. A telegram arrived addressed to Dr. James Y. Simpson, containing the news that the Medical Act had passed both Houses of Parliament, a fact promptly read aloud by Sir Charles Hastings to the members present. This Act established the General Medical Council, the registration of practitioners, ordained that unqualified persons could not recover charges at law, nor hold public posts; and, further, directed the compilation of an official British Pharmacopœia.

Another important question which exercised the minds of the profession of that day, that is, whether homœopaths should be recognised and consulted with or not, led to the passing of a resolution by a large majority, which disqualified both homœopathic practitioners, and practitioners who consulted with them professionally, from election as members of the Association.

In 1858 Sir Charles Hastings filled the post of President of the Council of the Association, a post conferred on him for life in 1843, and the duties of which along with those of treasurer, he discharged until his death in 1866. Dr. P. K. Williams of Worcester was secretary, and Dr. Andrew Wynter, editor of the journal. At that time no branch of the Association had been founded in Scotland; indeed, the total number of Associates in the whole country was only seventy-four. It was not until 1868, ten years later, that the first branch was formed in the Border counties of England and Scotland, followed in 1872 by the Aberdeen, Banff, and Kincardine Branch; then by that of the North of Scotland in 1873; Edinburgh succeeding these districts in 1875, the date of the forty-third meeting of the Association, and the second within its walls. It is worthy of a passing note that in Ireland the Association was represented in 1858 by only one single member.

The condition of medical matters in Edinburgh, when the Association next met in 1875 in that city, resembled the former meeting in several points. In 1858 a professor of the University of Edinburgh had just bestowed world-wide fame upon himself and upon his *alma mater* by the discovery of the anæsthetic properties of chloroform. In 1875 another occupant of an academic chair, Professor Lister, had lately made known the theory on which the protection of wounds, by the destruction or inhibition of bacterial organisms, is based, and which has been productive of almost as great an amelioration of the sufferings of patients after operation as chloroform confers during the actual performance. As on the former occasion, questions of grave import troubled the profession. The eternal sex question was upon them, and the members, who appeared afraid of the introduction of women into the profession, the timid and perhaps the shy, fought doughtily against their *bêtes noires*; their resistance was successful for the time, soon to be overcome. Unlike the meeting of 1858, and the approaching meeting of 1898, the relations between the leading members of the profession in Edinburgh and the governing body of the Association were the reverse of cordial. So strained were they, on account of what the Edinburgh members considered to be contemptuous and insulting conduct on the part of the Council, that many took no part in the business of the meeting. In fact, the President of the Section of Medicine had to be imported from London, in the person of the late Sir Richard Quain. It is revealing no secrets to state that the attitude of the local officials in charge of the arrangements for the meeting towards the central officials was one of armed neutrality, an attitude provoked by many signs tending to show that those in power followed the dictates of their own minds, and thought it beneath them to stoop so low as to hearken to the words of mere provincial members.

The relationship between the presiding body and the Edinburgh Branch, it is pleasing to note, has lately improved, even although the word "lately" be construed in its most literal sense, and absenteeism among the local Associates is not at all likely to raise a suspicion of the existence of any dissatisfaction with the governing body of the Association.

In 1875 the inaugural address was delivered by Sir Robert Christison, the President, who took up the cudgels in defence of the system of medical education as carried out in Edinburgh, marked then, even more than now, by a plethora of prolonged courses of didactic lectures, and by very few facilities for practical work. Dr. Warburton Begbie delivered the address in the Section of Medicine, Professor Spence in Surgery, and Professor Rutherford in Physiology. The President, Vice-presidents, and Secretaries of the sections were as follows:—

	Presidents.	Vice-Presidents.	Secretaries.
Medicine . .	Richard Quain . .	W. T. Gairdner. T. Grainger Stewart.	C. Muirhead. W. Stevenson.
Surgery . .	Joseph Lister . .	W. Pirrie. G. H. B. Macleod.	T. Annandale. John Duncan.
Midwifery . .	J. Matthews Duncan	A. Keiller. A. R. Simpson.	R. P. Ritchie. C. H. Cullingworth.
Public Medicine	Lyon Playfair . .	W. R. E. Smart. Arthur Mitchell.	Andrew Smart. T. R. Fraser.
Psychology .	W. H. Lowe . .	John Sibbald. T. S. Clouston.	J. J. Brown. R. Saundby.
Physiology .	J. Burdon Sanderson	J. G. M'Kendrick. J. Dewar.	T. Lauder Brunton. R. Caton.

Dr. Quain was unavoidably absent, and his place was filled by Dr. W. T. Gairdner.

The *locus* of the preliminary meeting was furnished by the Free Church Assembly Hall, a hall of a very different capacity, compared with the class-room of 1858, although the chemistry class-room in the old building, as it is now called, served for the four general meetings which followed. The number of members attending the different Sections came to about 1100, or 18 per cent. of the total in the Association (in 1858 only 8·5 per cent. of the members took part), so that if the mean proportion of the two former attendances is taken as a guide for the estimation of the numbers at the forthcoming meeting, as many as 3000 will be the relative figure, or just about enough to fill every available seat in the M'Ewan Hall.

The sectional meetings were all held in the different class-rooms of the University Buildings, the new buildings of the Medical Faculty were still in an embryonic state, while the Royal Infirmary, so familiar to us now, was five years from completion, or rather from opening, for even now it apparently is incomplete. The proceedings read very much like those of 1858; the Sections met and discussed more or less abstruse topics, and, like boys from school, escaped to enjoy the delights provided for them by the entertainment committee, presided over by Dr. J. D. Gillespie, or to pass their spare time in quiet contemplation of the novelties exhibited in the museums managed by Dr. C. E. Underhill. The President held a reception in the Music Hall and Assembly Rooms on the evening of the opening day; the Royal College of Physicians gave a conversazione on the following evening in the Museum of Science and Art; the Principal and the Senatus of the University received the members of the Association at a garden party in the Royal Botanical Gardens; and, lastly, the annual dinner took place in the Music Hall. It is to be fervently hoped that the clerk of the weather will see fit to repeat this July the perfect meteorological conditions which accompanied the meeting of 1875, and which contributed in no slight degree to the success of the various excursions arranged for.

A glance at the titles of the papers read during the meeting in the different sections is interesting, as affording an indication of the most prominent features of medical science at the time. Included among the papers offered to the Section of Medicine, we find one by Dr. Halliday Croom, on "Melæna in New-Born Infants," one by Dr. Craig, on "Jaborandi," and another on "Chloral." In Surgery, the only reference to antiseptic surgery, as revealed by the titles of the papers, is one, appropriately enough, by Mr. John Chiene, on "The Value of an Antiseptic Catheter"; Dr. John Duncan contributed a paper on "The Treatment of Nævus"; Dr. P. H. Watson described the operation for the excision of the thyroid gland, in which the dangers from hæmorrhage were emphasised, but no note given of the condition of the patient after the gland had been completely removed. In Public Medicine, Dr. Arthur Mitchell and Mr. Alexander Buchan contributed one of their well-known conjoint papers upon weather and mortality; while Dr. William Rutherford along with Monsieur Vignal demonstrated to the Physiological Section many of the results of their celebrated series of experiments upon the biliary secretion. Although the papers read at the Surgical Section appear to have little to do with the, then recent, discovery of sepsis and antisepsis, the President of the Section, Mr. Joseph Lister, in his introductory address gave an account of the system, and detailed the success which had attended its adoption by German surgeons, who had promptly recognised its value. It is noted in a contemporary journal that Mr. Lister's visit to Germany shortly before this had been truly of the nature of a triumphal progress.

Although, may be, the Edinburgh of 1898 can point to no recent epoch-making medical discovery on the part of her students and alumni, she can give an account of much good work done, a tale of men of worth far too long to inscribe, and strong evidence that the torch of medical progress burns as brightly as ever, and is carried forward as vigorously by her sons, as at any former period of her cherished history. Of late years, indeed, there has been a striking improvement in the all-round quality of the work done by the younger members of the School, work which indicates earnest purpose and deeply grounded faith in the value of individual clinical and experimental observations. 'Twere invidious to mention names, the members of the Association either know of, or will soon have an opportunity to learn something of them. Another of the great features of recent medical progress in Edinburgh has been the very marked awakening of the *Dei ex machina* to the demerits of their occupying all the avenues leading to the temple of knowledge in their own persons, and constituting what used to be the "Irish Question" in medicine. Those able to retain exclusive powers might choose to work themselves or not, although their personal efforts alone could only influence very minute portions of medical science or sciences; those who could help to extend their influence and capabilities, and who on accession to office could uphold the honour of the School, were not allowed, till lately, to do aught but listen to didactic lectures, in courses of one hundred or may be fifty; the true deep-lying laws of each subject remaining hidden, concealed by the obtrusive, partially illumined, and superficial data with which the cerebral cells were charged, until the crammed facts were released on the opening of the sluice-gates of examination; the memory reservoir readily emptied, but was again as readily receptive of further superficial surface water until the next examination. Didactic lectures have still to be endured, attended with diligence, and listened to with intelligence (by direction of the General Medical Council), but the student has greater facilities offered to enable him to understand the why, the *hoc*, the *propter hoc*, by his attendance on practical classes, capable in part of revealing the method underlying the madness of interminable statements of fact. If the present student of the Edinburgh School might be allowed to quote anything, it would be, *Ars longa, vita brevis*; and he might with reason object to the now compulsory study of extra subjects which he, should he have the energy and wit to approach them voluntarily, would regard with much greater interest and appreciation. Compulsion often kills what voluntary effort nourishes.

Among the numerous alumni of the Edinburgh School who will foregather once again on the scene of their former literary, and perhaps of other more personal struggles, many will surely be desirous of visiting the Fever Hospital, once the Royal Infirmary, now doomed to destruction, and recall the days when possibly they had seen the grounds around it covered with tents for the reception of the victims of typhus, or had almost been unable to calculate the current death-rate without using the higher branches of mathematics.

The Royal Medical Society's Hall will awaken many a fond thought of quondam argumentative tourney upon vast subjects of medical science, or again upon the most trivial point of private business.

Others, no doubt, will visit the old School of Medicine in Surgeons' Square, where Spence formerly taught surgery, and Handyside anatomy, to students, less graceful perhaps than those who now sit on the benches and strive to vindicate the aspirations of woman.

The Old University (not so long ago it was the New College),[1] Minto House, teeming with memories of Syme, and Surgeons' Hall, will arouse memories of more youthful times; while the New University Buildings, especially the magnificent M'Ewan Hall; the Royal Infirmary, still like an amœba, though it be stationary, pushing out great pseudopodia into the surrounding district, absorbing houses and land,—an Infirmary which will contain more beds on completion of the Jubilee Pavilion, than any public hospital in the British Isles.

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[1] In contradistinction to the original building begun in 1583. The original college was not a structure of elegance or dignity, but was founded by altering "Hamilton House," or "The Duke's Lodging," built by the Duke of Chatelherault, to make it suitable for the reception of students on board, and for the provision of lecture rooms. The actual site (Kirk-of-Field) closely corresponds to the centre of the quadrangle of the present building, and at that time was just inside the city bounds, for in 1512, after the battle of Flodden, it is recorded that the Cowgate Loch was drained, the town extended to the south, and a wall built to include the great "Kirk of the Blessed Mary of the Fields," which stood partly on the present University ground, chiefly from where the north-west corner of Drummond Street now stands towards Chambers Street.

From October 1896 to October 1897, 9628 patients were treated as in-patients, 28,697 as out-patients. The death-rate in the Hospital was 7·2 per cent., or, not counting the cases admitted when moribund, only 5·4 per cent.; while the cost for maintenance, per occupied bed, per annum, was £19, 3s. 1d.; the total cost per bed, £58, 8s. 10d. The New Infirmary has been brought up to date by the introduction of electric lighting, and of a complete system of telephonic communication between the various parts of the huge building, the addition of a well-equipped electrical department, and several additions to the surgical house, for the provision of special operating theatres and out-patient rooms apart from the wards.

The Faculty of Medicine in the University, of which Professor T. R. Fraser is Dean, is made up of thirteen chairs, ten lectureships, and thirty minor posts. The lecturers belonging to the School of Medicine of the Royal Colleges number at least sixty-five, nearly all engaged in conducting classes under the same conditions as those of the University. The majority are recognised by the University as lecturers, attendance on whose lectures qualifies for the academic degrees. Still further, there are two schools for the medical education of women, in which many of the extramural lecturers conduct classes separately from the men. Lately post-graduate courses have been held in autumn and spring on advanced and special subjects, so that Edinburgh cannot be blamed for paucity of teachers, or lack of ardour in the teaching of medical science. About 1500 students matriculate each year in the Medical Faculty of the University, and nearly 1200 attend the Medical School of the Royal Colleges. The Edinburgh Medical School thus continues to exercise a widespread influence upon the trend of general medical thought and practice.

Edinburgh—Auld Reekie, as she used familiarly, if somewhat uncermoniously, to be termed—teems with interesting relics of great historic events in the past, eloquently reminiscent of the days when the history of Scotland was acted within her walls, few vestiges only of which remain. Then Edinburgh, as the heart of Scotland, throbbed with exultation over a successful encounter with her enemies of England, or quivered with anxiety for the safety of her absent sons. Now her citizens live in happier days, when war's alarms have ceased to vex, and her erstwhile opponents south of the Tweed are her generous rivals in the peaceful arts, comrades in war, and affectionately thirled one to another. The members of the Association belonging to the Edinburgh Branch, both those indirectly connected with the School and those included among the teaching fraternity, will unitedly strive to render the approaching meeting worthy of the traditions of the city, and to endow it with a significance commensurate with the great importance of an Association whose members are drawn from within the confines of the Empire on which the sun never sets.

A. Lockhart Gillespie.

OBITUARY.

Lord Playfair.

Lyon Playfair was born at Meerut on the 21st of May 1818. He was the second son of Dr. George Playfair, Chief Inspector of Hospitals in Bengal, and the grandson of Principal Playfair of St. Andrews. Coming home from India as a child, he, after the usual school training at St. Andrews, attended Arts classes there. He then went through the medical curriculum in Glasgow, but did not graduate, partly because he had been attracted from medicine to chemistry by the influence of Graham, at that time Professor of Chemistry in Anderson's College, partly because the state of his health made a holiday desirable, a holiday which he spent in a visit to his parents in India. In 1838 he went to Giessen to continue his chemical studies under Liebig, and on his return to this country he worked for a short time with his old master and friend, Graham, in the laboratory of University College, London. When Liebig, on the invitation of Prince Albert, came to this country to instruct our farmers in the scientific principles of agriculture, he asked Playfair to accompany him as assistant and interpreter. We can easily imagine that it was this introduction to Prince Albert that led to a new change in the direction of Playfair's activity.

His Royal Highness and Playfair both took a special interest in the applications of science to the welfare of the people. In 1844 he was appointed a member of the Royal Commission on Public Health, and from that time till his death he was almost always a member, and often the chairman of some commission. He was remarkably well fitted for work of this kind. He had a sufficient knowledge of science, particularly of chemistry, but, what was more important, his scientific knowledge was always available, and he had the rare gift of common sense and knowledge of men. He was able to see, not only what ought to be done, but what could be done, and also how it could most easily be done. He was thus able to make more of his talent than most men can. In 1843 he was appointed Professor of Chemistry in the Royal Institution of Manchester, and in 1846 Chemist to the Museum of Geology. He was appointed Special Commissioner in charge of the department of juries, in connection with the great Exhibition of 1851, and again in connection with the exhibition of 1862. In 1858 he was elected Professor of Chemistry in the University of Edinburgh. Here his organising power was specially valuable; he developed the practical teaching of chemistry in a way that seems incredible to those who know the miserable accommodation then at his disposal, and it is very much to him that we owe the system of Science degrees. In 1868 he resigned the chair of Chemistry, and became Member of Parliament for the Universities of St. Andrews and Edinburgh; he held this seat till 1885, when he was elected M.P. for Leeds. He was Postmaster-General in 1873–74, and Chairman of Committees and Deputy Speaker in 1880. He was knighted in 1883, and raised to the peerage in 1892.

ANALYTICAL REPORTS.

Peptenzyme Preparations.

The Peptenzyme Company, of 38 Alfred Place West, London, S.W., have submitted for our approval several of their preparations of peptenzyme. These include an elixir and a powder of this substance, as well as tablets of the same. Peptenzyme is a complex body, prepared in accordance with the most recent theories of ferment formations. That is to say, the zymogens in the ferment-forming tissues are not destroyed, as is usually the case, during the extraction of the actual zymines in them. It is well known that if the zymine-forming glands be removed from a fasting animal, the zymine is almost entirely present in its earlier and inert form, the zymogen. A fluid extract of the tissue containing the glands, if obtained and preserved under aseptic conditions, is inactive. Contact with air, and therefore with bacteria, or the addition of an acid, causes the transformation of the zymogen into the zymine. For peptenzyme, it is claimed, that the zymogens are present in it along with some active zymines. In its formation 1000 (? 1000 parts) of the following glands are taken :—The salivary (which glands ?), peptic, pancreatic, Lieberkühn's, and Brunner's glands, mechanically freed from fat, water, and muscle, dried, powdered, and mixed with the ferment extract of 1000 spleens and livers. It is not at all clear as to what is meant by 1000 Lieberkühn's or 1000 Brunner's glands, as will be readily apparent to any one reading the description of the process of manufacture.

To one part of the powder, composed of these portions of the alimentary tract, one and a half parts of powdered cane-sugar, one and a half parts of milk sugar, and one-sixth part of citric acid is added; so that every 4·166 grs. of the total will contain a portion equal to 0·1428 gr. of each gland noticed above.

Thus of the powder of 7 glands,	1 part = $\frac{1}{7}$, or 0·1428 part of each.
Cane-sugar, .	1·5 ,,
Milk sugar, .	1·5 ,,
Citric acid, .	·166 ,,
Total .	4·166 parts.

Each 5-gr. tablet will therefore contain 0·171 gr. of powdered material from each gland. Five grs. of the powder will contain the same amounts. We have not had an opportunity of testing its properties clinically, but have submitted it to several tests *in vitro*. The elixir is a pleasantly flavoured brown fluid, with a slight acid reaction; and a few drops added to an acid solution readily dissolves fibrin, not so speedily or so markedly after addition to a solution of carbonate of sodium containing some fibrin. In a few moments it alters starch to dextrin, and shortly after transforms part of it into maltose. As the action of other organic extracts has been shown not to be destroyed by gastric digestion, any therapeutic bodies which may be derived from the liver and spleen will be able to perform their functions after absorption. In fact, peptenzyme is not only a digestive medicament, but a comprehensive compound of organic extracts, and appears to be well fitted for the task for which it has been devised, although we cannot help wishing that we were more conversant with the pharmacology of extracts from Brunner's and Lieberkühn's glands, and what they are able to accomplish in the body.

VIMBOS AND VIMBOS LOZENGES.

WE have subjected samples of vimbos and vimbos lozenges to careful analysis, with the following results:—

	Vimbos in Jar. Per Cent.	Vimbos Lozenges. Per Cent.
Water at 110° C. . . .	26·54	8·17
Total solids at 110° C. . .	73·46	91·83
Ash	24·13	13·31
Organic matter . . .	49·33	78·52
Of the organic solids, p.c. of total—		
Alcoholic extractions .	23·46 (12·76 nitrogenous)	31·98 (13·73 nitrogenous)
Proteid—		
Coagulable .	14·98	27·8
Non-coagulable .	9·56	16·8
	24·54	44·6
Fats (ether extract) .	1·33	1·94

Both these samples are therefore stimulating and nourishing, and contain a greater proportion of proteid than lean beef, much of it in a predigested form, containing a very much greater proportion of nitrogenous as well as non-nitrogenous extractive bodies. The fat is present in about the normal percentage common in lean beef. The lozenges, perhaps, err in being made of too small a size, the mean weight per lozenge only being 0·256 grms., or 7¼ grs. apiece, the actual weight varying from 0·278 to 0·252 grms. The actual amount of proteid present in each is therefore about 0·115 grms., or as much as is in 0·5 grms.—14 grs.—of beef.

The non-coagulable proteids, precipitated by alcohol, were purified by re-precipitation with ammonium sulphate, the peptone which separated from the albumoses treated with phospho-wolframic acid and baryta, purified and weighed. The sum of the albumoses and peptones, or proteids soluble in boiling water, in both forms are very considerable, and, when added to the native proteids of flesh, and to the nitrogenous extractives, compare very favourably with other true nutritious extracts.

It seemed to be of interest to calculate out the nutritive worth of one vimbos lozenge, taken as weighing 0·251 grms., compared with other foods. Using König's factors, we find that one lozenge equals 0·350 grms. of oatmeal, 0·625 grms. of lean beef, 0·577 grms. of egg. Each lozenge, therefore, is nearly one and a half times more nutritious than the same weight of dry oatmeal, two and a half times more nutritious than lean beef, and rather more than twice as nourishing as egg, while the constituents are more easily digested.

Thus it follows that vimbos is a preparation rather more nourishing than the articles named, possessing the advantage of being of easier assimilation, and practically equal to the best of the other beef extracts in the market.

FORRET'S MILK STERILISER.

We have subjected this new milk steriliser to a practical test, and have found it to answer its purpose in an excellent manner. Forret's steriliser consists of an outer vessel made of tin, shaped like a decoction-pot and furnished with a removable handle.

Water is boiled in this vessel over a flame, and then an inner vessel filled with milk introduced. This inner tin is fitted with a lid, through which a rod passes, ending inside in a flat oblong sheet of tin, slightly curved; by rotating the rod from the outside the stirrer mixes the milk, and causes the thorough heating of all portions. The apparatus fulfils its purpose in a very satisfactory way, and the sterilised milk has little or no "boiled" taste. Two points are capable of improvement. The stirrer-rod might be fitted with a handle (for instance with one shaped like the handle of a key), and the inner pot should have a handle like that of a milk can to lift it out by; the two small handles with which the inner pot is at present furnished, get so hot that its removal is rendered troublesome, necessitating the use of cloths or kettle-holders. In other respects the steriliser is all that can be desired; it is simple, inexpensive, and efficacious; is easily cleaned out, and from the method of tinning employed does not rust easily.

PROTARGOL.

One of the latest preparations suggested for use in inflammatory affections of the urinary tract, and found by many to be of great service, is a silver combination with proteid—protargol. The company of Fr. Bayer & Co., Elberfeld, have sent us a sample of this substance, which is in the form of a fine light yellow powder, readily soluble, with a brown colour, in distilled water (1 in 2), the solution being slightly alkaline in reaction, and giving a precipitate with hydrochloric acid, soluble in excess. The powder lost 3·66 per cent. of water at 110° C., the remainder giving 12·8 per cent. of ash, of which 8·02 per cent. represented silver nitrate originally present in the protargol.

Protargol is not simply a mixture of proteid and a silver salt, but a true chemical combination. This is shown by the inability of hydrochloric acid to separate the silver from the proteid. The ready solubility in water points to the proteid combined in it being much simpler in nature than an albumin. Like hetero-albumose, the compound is precipitated by hydrochloric acid, shortly after the neutral point has been passed, the precipitate being soluble on the further addition of acid, reprecipitated and afterwards dissolved again on the gradual addition of an alkali. If, along with the hydrochloric acid, strong nitric acid be also added, the silver separates out as the chloride, while the proteid can be obtained in an uncombined state.

It acts as a strong antiseptic, in 1·5 per cent. solution, exerting a marked effect upon gonococci, while it does not irritate the tissues. Its mode of action is doubtful, but probably arises from dissociation of the silver salt from the proteid through the action of the bacteria, either from the acids formed by them, or by their attacking the proteid moiety to succumb to its silver partner. If further experience corroborates its antiseptic powers, protargol, without doubt, should prove of immense service in other surgical domains, because of its non-irritating properties, than in the treatment of urethral inflammations alone.

Chinosol.

This substance, sent us by Kühn of 36 St. Mary-at-Hill, London, the sole licensee for its sale in this country, is in the form of a yellow powder, very similar in appearance to iodoform, but with the immense advantage of being inodorous. It is very soluble in water, forming a bright clear yellow solution, with a slightly aromatic smell, and a taste which is somewhat astringent and tart. Its solutions have no unpleasant action upon the cutaneous nerves, nor do they discolour the skin. A report by E. Klein, M.D., shows that, although it has no power of coagulating albumin, solutions of the strength of 1 to 250 retard very appreciably the growth of the spores of *Bacillus anthracis*, *Staphylococcus pyogenes aureus*, and of 1 to 200 *Bacillus coli communis*, while five minutes' application of 1 to 100 in the case of the spores of the first and of 1 to 150 in the case of the last two organisms seemed to prevent any growth at all. Compared with the action of carbolic acid, the effect of chinosol appears to be much greater. Chinosol in solution of 0·66 per cent. acts as powerfully as 5 per cent. solutions of carbolic acid, after five minutes' exposure of the organisms to their solutions. Anthrax spores survive immersion in 5 per cent. carbolic acid for forty-eight hours; 1 per cent. chinosol kills them in five minutes. Again, 5 per cent. carbolic acid solutions act harmfully on the skin; a 1 per cent. solution of chinosol has no evident effect.

Chinosol is supplied in the form of powder, as compressed tablets, each containing about 2·8 grms. of the drug, and as surgical dressings, soaps, etc. There is no doubt that, should experience corroborate experiment, chinosol has a future before it,—as a non-irritating, non-corrosive, non-poisonous antiseptic of great power.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Four Weeks ending May 28, and for the Year from January 2.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°.	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 2.	Actual.	Accumulated from Jan. 2.	
Mean	48°0	*[1] 197° [2] 446°	27° 646°	2·0	11·0	178	512	2°·75
Observed	46°·5	[1] 178° [2] 513°	37° 423°	2·1	10·4	164	502	2°·45
Difference	−1°·5	[1] −19° [2] +67°	+ 10° −223°	+0·1	−1·4	−14	−10	−0°·3

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland, during May, and since January 1. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Nervous System.		Respiratory System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 1069 [2] 5858	189·5 207·3	240 1097	42·6 38·9	105 553	18·6 19·5	128 656	22·7 23·2	187 1288	33·1 45·6
Actual Deaths and Rate per 10,000	[1] 1131 [2] 5623	200·4 199·0	258 1223	45·9 43·3	105 553	18·6 19·5	147 665	26·0 23·5	172 1094	30·0 38·7
Difference from Mean	[1] + 62 [2] −235	+10·9 − 8·3	+18 +126	+3·3 +4·4	±0 ±0	±0 ±0	+19 + 9	+3·3 +0·3	− 17 −194	−3·1 −6·9

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 63 [2] 329	11·1 11·6	28 142	4·9 5·0	75 455	13·3 16·1	117 561	20·8 19·8	51 231	8·0 8·2
Actual Deaths and Rate per 10,000	[1] 87 [2] 400	15·4 14·1	26 137	4·6 4·8	92 472	16·4 16·7	127 580	21·5 20·5	55 283	8·7 10·0
Difference from Mean	[1] +24 [2] +71	+4·3 +2·5	−2 −5	−0·3 −0·2	+17 +17	+3·1 +0·6	+10 +19	+1·7 +0·7	+ 4 +52	+0·7 +1·8

* Note.—The figure [1] denotes the data for May, [2] for year to date.

The four weeks ending on 28th May were colder than usual, more sunless, with a practically normal rainfall, and a decrease in daily variability of temperature. The defect in the mean temperature value was due both to the lack of heat over 42°, and to the excess of cold under 42°. The first week was warmer, the last three colder than usual, much of the cold weather being occasioned by the development of disturbances to the east of our islands, with consequent northerly and north-westerly winds. From January 2 the figure for the day-degrees over 42° still presents a credit balance, while that for those below 42° remains much below normal. The total rainfall is only slightly below the average, as are the hours of bright sunshine.

The increase in the death-rate noted for April again obtained, but not so markedly, and was chiefly due to deaths from constitutional, nervous, and digestive diseases; in the latter the excess amounted to 37·5 per cent. of the number expected. Influenza caused twenty-two deaths. Deaths from pneumonia showed an excess equal to 22 per cent. of the looked-for number.

From the commencement of the year the number of deaths is still below the mean, due more particularly to a diminution in those from respiratory diseases. On the other hand, diseases of the constitutional and digestive systems have been much more fatal than usual, the first by 11 per cent., the second by 21 per cent. of the totals expected. Cancer has also caused many more deaths than usual, 22 per cent.

May, therefore (characterised by colder weather than usual, with rather less sun, a low barometer, but with barometric gradients so arranged that northerly winds were prevalent, a smaller variability of temperature and, in the East of Scotland, a very slight excess of rain), shows an increased death-rate (10·9 per ten thousand), a great number of deaths from digestive diseases, and, to a less marked degree, from constitutional disorders, along with a diminished mortality from respiratory troubles. The year to date with all the accumulated values on the right side, especially the defect in the number of day-degrees below 42°, presents features practically identical with those shown by the four weeks ending May 28.

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ORIGINAL COMMUNICATIONS.

THE APPLICATION OF REST IN THE TREATMENT OF DISEASE OF THE SKIN.[1]

By W. Allan Jamieson, M.D., F.R.C.P.Ed., *Physician for Diseases of the Skin, Royal Infirmary, Edinburgh.*

Before taking up the subject proper of my address, a few words on the history of dermatology in Edinburgh may not be inappropriate. This is but a brief record, for it dates back only to the time when John Hughes Bennett was professor of clinical medicine, from thirty to forty years ago. So long as he taught in the old Royal Infirmary, he had wards for cutaneous diseases. The instruction was simple, the varieties few, and the remedies fewer still; but his prelections had the inestimable advantage of being dogmatic. Eczema, scabies, and psoriasis made up the bulk of the cases, though he was fond of demonstrating examples of favus, then, as now, not a rare disease here. Eczema he treated, if acute or moist, with alkaline water-dressings; if chronic, infiltrated, or dry, with citrine or zinc ointment. Psoriasis was cured for the time by free inunctions with unguentum picis, and scabies with sulphur ointment, though, curiously enough, he maintained that the sulphur was unnecessary, and only acted by thickening the salve. The conjunction of the two last-named ingredients rendered the atmosphere of the wards suggestively malodorous. When Bennett relinquished the teaching of clinical medicine the Skin Wards were abolished, and for many years Sir Douglas Maclagan, almost alone, gave an occasional lecture on integumentary disorders, and admitted a few cases to his wards.

In 1877, by the kindness of the directors of the Royal Public Dispensary, I was granted a special out-patient hour for skin cases, twice a week. In 1884, mainly through the intervention of the late Dr. D. R. Haldane, then one of the most influential managers of the Royal Infirmary, as he had been for long the very best lecturer on practice of medicine in the Edinburgh School, an out-patient department was established. This proved so successful, that, in 1891, six beds were assigned to cases of skin disease, in wards which were not constructed for the purpose; and in 1892 the department was still further strengthened by the appointment as assistant-physician of our excellent secretary, Dr. Norman Walker.

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[1] An introductory address, delivered to the Section of Dermatology, at the Annual Meeting, British Medical Association.

The subject on which I propose to offer some remarks, in opening this section, is "The Application of Rest in the Treatment of Diseases of the Skin." Rest, in its wider sense, has been made the theme of a medical classic by Hilton, but in it he has alluded but little to its place in dermatology; indeed, the branch had hardly been recognised as a division in his day. Mr. Morris has published some excellent and well-timed observations on "Over-treatment in Eczema," but there appears to me to be room for a more extensive survey. In the space of time at my disposal many details must be omitted or but touched on lightly; but these can, perhaps, be better filled in by each member present at his leisure. And first it is necessary to inquire, What is meant by rest? Certainly not absolute inactivity. This the surgeon may aim at, at all events for a brief preliminary period, in the coaptation of fractured bones; but even he has very early to think of the tendons, muscles, vessels, and nerves in the neighbourhood, to say nothing of the related joints, which would all suffer were complete quiescence insisted on for too long a time. Absolute rest is impossible in the case of the skin. To see this we have but to remove a bandage, which has been for a week or so coiled round a limb. On passing one's hand over the surface, a cloud of dry, loose, epidermic particles arises, showing that, though occluded from the air and immovable, yet the process of cornification has been continuously going on; the thin protective layer of keratine which forms the outer boundary has been constantly renewed from beneath, but has not been shed imperceptibly, as in healthy normal conditions of freedom. And if the desquamation from the surface thus becomes visible to the eye, in quite similar fashion does the insensible perspiration, or the secretion of the oil glands, if allowed to accumulate through defect of ablution, assert its presence by impinging on the olfactory nerves. The renewal of the integument, and the secretion of its glands, are therefore uninterrupted throughout life.

But while it may be out of our power to procure by the means at our disposal absolute and entire quiescence, comparative repose is attainable, and this, in the great majority of cases, is sufficient for our purpose. Rest, then, consists in the removal of irritants, whether these be such as worry and distress the mind, or tease and vex the body. The prescription given by Horace would not, we fear, be quite an acceptable one at the present day, however closely life in imperial Rome resembled in some respects that of the final years of the nineteenth century:

> "Si te grata quies et primam somnus in horam
> Delectat, si te pulvis strepitusque rotarum,
> Si laedit caupona, Ferentinum ire jubebo."[1]

The contrast between life in a busy city and that in a torpid, small country town, with no golf links near, is too strong to prove agreeable. Yet one can thoroughly understand how the genial country gentleman we know Horace to have been, preferred the stillness of the little town to the noise of Rome, with the rumble of wheels, and the carousals at the tavern next door. We, at the present day, seek rest more in alternation of employment than by taking refuge in Sleepy Hollow. Sophocles, indeed, emphasises the value of, and the intense longing for, rest when he makes his beautiful heroine, Deianeira, say of Heracles—

> "*ὡς ἢ τελευτὴν τοῦ βίου μέλλει τελεῖν,*
> *ἢ τοῦτον ἄρας ἆθλον εἰς τό γ' ὕστερον*
> *τὸν λοιπὸν ἤδη βίοτον εὐαίων' ἔχειν.*"[2]

The whole of this tragedy possesses exceptional interest for us as dermatologists, for the motive turns on the fatal, though unwitting, gift of Deianeira to Heracles, which caused the hero unendurable torture through inflaming his skin. One would like to linger over the origin of the idea in the mind of Sophocles, how the blood of Nessus acquired its toxicity, solely by exposure to the warmth of sun or fire, kindling into activity the long latent germs. But this fascinating excursus would lead me too far.

Before proceeding further, there is a question which demands reply, namely, Why is rest necessary? Now, there are many circumstances under which rest is required; but, for our present purpose, only one will be commented on. We need rest as a consequence of fatigue or exhaustion. After the expenditure of energy, a time arrives when indications are afforded that its further continuance must cease. The wise man assents, yields to nature's law, and desists from further effort. He takes rest. But there are many who will not heed the dictates of reason, and decline to rest. In place of rest, these substitute what may be called a "pick-me-up." This is by no means merely alcohol in some form, or coca, or such drugs as antipyrin, phenacetin, caffeine, and the like, though such are largely indulged in. The most frequent mode in which a so-called restorative is ingested is as tea. Tea is made to take the place of rest, so that the jaded brain and wearied muscles may lose consciousness of fatigue, and may be driven on regardless of the thus oft-postponed, yet inevitable, final breakdown. I leave to physiologists and biological chemists to explain

[1] "Epistolarum," lib. i. epist. xvii. lines 6–8.

[2] "Trachiniæ," lines 79–81.

the action of tea and its congeners; but the undoubted fact remains, that the employment of nerve stimulants is at the present day, in an increasing proportion of cases, made to supplant natural needful rest.

Turning now to the skin, the very name applied to the cutaneous manifestations of disorders of the integument suggests the idea of rest. We speak of an "eruption," as the visible feature from which most of our conceptions of the nature of the ailment are drawn. Now, the term "eruption" is associated in our mind with some disturbance from within, something which, having interfered with the normal balance of the economy, has come in this way to the surface. To the popular understanding, which has not even yet been able to free itself from the influence of the old humoral pathology, this indicates a diseased state of the blood, and from this view even educated members of the profession have not entirely dissented. Yet, so far, there are few demonstrable alterations in the blood which we can fix on as causative of a skin disease. Anæmia poses as a predisposing and maintaining factor, scorbutus as a determining one; but, of all the conditions which the microscope or biochemical investigation have so far revealed, there is hardly any one we can positively assert is solely blameworthy. . . . At the same time, it is undoubtedly our duty to rest the skin from the deeper side, by what therapeutic means are at our command. Thus, all internal causes which may be suspicious are to be eliminated, by correction of dietary, by cutaneous sedatives, of which antimony may be taken as a type, by hæmatinics, and by agents which influence metabolism, such as arsenic, or flush the sudoriferous canals, as pilocarpine.

More closely considered, rest is procured for the skin by freeing it from the effects of the over-activity of its own constituents or appendages. Of this an example is provided by ichthyosis. The most prominent feature here is the continual accumulation of the horny layer on the surface, in place of its regular and imperceptible desquamation. The researches of Ohmann Dumesnil and Bowen point to the cause of this anomaly being due to a failure of the normal separation of the epitrichium, owing to an arrest of development of the hairs and sebaceous glands, the epitrichium thus becoming fused with the outer layers of the epidermis. In this way perversions of nutrition arise; and should the adhesion take place on the palms or soles, the masses of keratin may acquire great thickness. The same result may occur elsewhere, as proved by the examples of ichthyosis hystrix which are occasionally met with. This theory supports the efficacy of external therapeutic measures in this disease, as opposed to mere internal remedies. The ingenious reasoning of Byrom Bramwell,—that as the hard, dry, scaly integument of confirmed myxœdema becomes again soft, pliant, and natural, if thyroid extract be administered, similar consequences might be expected to follow were it given in ichthyosis,—has hardly been borne out by experience, any results of its exhibition being but temporary. But there are keratolytic applications which, used early enough, can restore the normal polish to the skin. Of these, resorcin is the chief, and used as soap, supplemented by its employment as an ointment, or in combination with glycerin of starch, we can, in many cases, perfectly remove the abnormality. We can compel the over-active epidermis to rest by these means.

We find evidence of increase of the secretive energy of both the sebaceous and sweat glands, and in this way also is the quietude of the skin disturbed. Round the question of the nature and the significance of seborrhœa, war still wages, though more languidly than was the case a year or two since. This may be said, however, that the rôle of the oil glands, as being something more than mere appanages of the hair system, and their function merely to grease the capillary growth, has again come with greater prominence to the front; while that of the sweat glands has rather retired, from the position of cutaneous lubricants, to that of being more purely the irrigating and refrigerating element. Under many and various circumstances, we find that sebum, or an oily coating, concretes on the surface. Whether this is directly due to the stimulus imparted by micro-organisms, whether it is to be viewed as an expression of chemotaxis, how far the altered condition of the soil, commonly an anæmia, is to blame, or whether organisms and their toxins are merely secondarily present, can hardly be yet said to be positively settled. That seborrhœa either of the concrete or the oily form does prove an irritant is certain, though possibly all the deleterious results ascribed to it may not be thoroughly well grounded. Our efforts to obtain rest in this instance must go further than merely removing the accumulation of oil and degenerated epidermic scales. The anæmia must be corrected by toning up the soil, not merely by iron to enrich the [illegible] to neutralise the syphili[illegible] ergot or ichthyol, to cons[illegible] uses. Locally, sulphur, [illegible] ing effect, quite apart from [illegible] the astringent action of co[illegible] Hyperidrosis weakens th[illegible] into a swamp. And jus[illegible] the air becomes pestilen[illegible] give off offensive odours, and [illegible] to occasion irritation, which [illegible] employ the keratoplas[illegible] cylic acid, 3 per cent., in [illegible] ered talc, or orthoform may [illegible] this manner we can give rest [illegible] servant.

[illegible] in which our efforts must [illegible] rest for the skin, is that in which it is necessary to modify abnormal perversions of functional activity. This is usually manifested by some form of hyperæsthesia, of which pruritus is the commonest expression. Pruritus, or the sensation of itching, is such a frequent accompaniment of cutaneous disorders of all kinds, and is often the chief, if not the sole subject of complaint, that its relief is continually being demanded. As examples, we may select those forms which are especially aggressive at the two extremes of life, and in both cases it constitutes the most prominent, if not the only symptom visible to the eye, or merely cognisant to the sufferer. The age of the patient has a special bearing on the methods which must be adopted for its repression; the locality has in general a minor claim. In infants and young children, one must bear in mind the tenderness of the skin, its yet imperfect development, particularly as regards the as yet incomplete evolution of the hair and oil-glandular symptoms, since children may and do perspire readily enough. One of the most troublesome of the neuroses which affect them is lichen urticatus, or urticaria papulosa, a complaint which, while found occasionally in the better ranks of life, has its most perfect manifestation in the poorer classes. The skin in those afflicted by it almost always exhibits evidence of malnutrition, partly the result of bad hygiene, quite as much, perhaps, that ascribable to improper dietary. Thus it is usually dry, thin, anæmic, so that those remedies, both external and internal, calculated to correct this are indicated. Hence our duty in endeavouring to give rest to the integument is to discover and amend all faults of feeding or attention discoverable; and these even among the poor are in most cases attainable, since they mean no more than a simplification in the matter of food, and in more judicious modes of cleansing. In place of the strong carbolic soap often employed, we prescribe either merely ablutions with gruel, or with a superfatted naphthol soap, cotton or flannelette to be worn next the skin, accompanied by the inunction of glycerin of starch, made with double the quantity of glycerin of that in the pharmacopœia, medicated by the addition of naphthol, camphor chloral, tumenol, or resorcin. Sometimes an oil containing menthol and a little lanoline, or adeps lanæ, proves more grateful. Internally, antipyrin, in small doses at night, is valuable in promoting sleep.

At the other extreme of life we encounter pruritus again, that termed senilis, though it may cause annoyance at an age not old, if counted by the years since birth. Here, too, the skin is apt to be thin and anæmic; but the cause is less remediable, since it is the result of atrophy; the peripheral circulation has shrunk, and, as a consequence, the glandular structures diminish, or wholly cease their activity, and the integument becomes dry, hairless, and devoid of oil. With this wasting, perversions of sensation arise, and the old man or woman has his or her rest disturbed by night and by day by tormenting itching. Now, while it may be impossible to create new capillaries, yet those which still exist can be made to do more duty, and the sweat, and possibly the sebaceous glands, are not so completely damaged that their functions cannot be in a measure resuscitated. The sudorific action of pilocarpine can be brought into play to calm the pruritus. We thus flush once more the periglandular plexuses; and if this be repeated night after night for a couple of weeks, a great amelioration will certainly, sometimes a permanent cure, be obtained. As in the young, glycerin of starch is likewise a valuable adjuvant, and temporary relief at least can often be procured by gentle ablutions with a well-made superfatted menthol soap. Warmth, too, is essential in the old; but the underclothing selected must be of the softest and smoothest wool, that derived from the Australian breed of sheep being particularly serviceable.

But in the large group of the inflammatory affections of the skin, we find many examples in which we must have recourse to measures for procuring rest. We naturally turn to eczema in the first place, as being the commonest to invoke our aid. Whatever view of the nature of eczema may be determined on in the discussion which is to follow, its relations to catarrhal processes cannot be overlooked; and our most successful efforts to cope with it are those which follow the lead given by this theory. It does not matter whether we regard it as a parasitic catarrh or not, provided we bear in mind that it is a catarrh. We treat it on the same principles as we do an internal catarrh, though we can apply remedies which are impracticable in the case of internal catarrh. Just as in bronchitis we endeavour to soothe the inflamed and irritated mucous membrane by keeping the air of the apartment continuously moist and warm, so in eczema we envelope the raw, denuded, leeting surface with a soft, bland, aseptic medium—a starch jelly—with which is combined a proportion of boric acid, the least irritating, if perhaps the weakest of our available correctors of putrefaction. That it has this property was proved by an experiment which one of my clerks thought fit on his own responsibility to try. A patient with very extensive and profusely secreting eczema was being poulticed with boric starch jelly. One day, on making my visit to the ward, I was struck by the offensive odour arising from one side of the body, when the poultices were removed in my presence. On remarking on this, my nurse said that this clerk had doubts of the necessity of incorporating the boric acid with the jelly in preparing the poultices, and had asked her to have some made without it and applied to one side. The test was conclusive. While that side to which the boric starch had been applied was sweet and odourless, that to which the plain starch had been used was offensive in the extreme. The micro-organisms which set up putrefaction in eczema seem easily neutralised; but at times they resist boric acid. In general, dusting with a weak salicylic acid powder, or painting with nitrate of silver dissolved in sweet spirits of nitre, before renewing the poultices, is sufficient in such cases to get over the difficulty. One of the most obstinate of the characteristics of eczema is the infiltration or induration which accompanies it, and which persists as a leathery condition after the surface has healed. This often melts down marvellously under the continued employment of the boric starch jelly. But, in certain cases of long-standing disease, we cannot wholly get rid of it by their agency, even if we could prolong their use. Until this has disappeared, the eczema is not cured, and will certainly recur on very slight provocation, if not spontaneously, so soon as the patient attempts to return to his usual habits of life. Where a limb is the part affected, one of the most efficient methods of causing the absorption of the infiltration is by closely enveloping it in strips of the salicylic soap plaster which Pick of Prague has introduced. The strength used may be the 2½ per cent., or the 5 per cent., according to the degree of the infiltration, the age of the patient, and the sensitiveness of the skin. The plaster is worn for several days up to a week, and, on its removal, a distinct, sometimes a remarkable restoration of pliancy will be found. It is important that the plaster should contain no resin, as this gives rise to redness and irritation, and largely neutralises the absorptive action.

But there are some cases of eczema in which neither the boric starch poultices, nor the salicylic vaseline, subsequently applied, prove curative. Such may present the seborrhœic type, and, implicating the cheeks, seem to have had their origin in seborrhœa of the scalp, or eczema of the margins of the eyelids. In a case of this kind, the treatment referred to above served merely to aggravate the disease, and to occasion its further extension. Hebra recognised the advantage of smearing an ointment such as his diachylon salve on cotton or linen pretty thickly, and then placing the strips so prepared in close approximation to the skin, as compared with the plan hitherto adopted of simply rubbing it on, and emphasised this in his prelections. But Unna greatly improved on this in his salve muslins, a porous cloth carrying on and in its substance a thick stratum of an ointment, of such hardness and consistence that it just melts slightly at the heat of the body, but does not become fluid or run. It also does not become rancid by keeping, if reasonable precautions are taken. When pieces of, say, his zinc ichthyol salve muslin, that of which my experience has been the largest and the longest, are applied to the skin of the face, we obtain an amount of rest attainable by no other means with which I am acquainted. The case alluded to immediately improved, and was in the course of a very short time brought to the dry and scaly condition which precedes complete cure. It cannot be from the action of the muslin as a parasiticide; it does not seem to me to go very far in proof of the microbic origin of eczema, be that true or not, but it most effectually gives rest to the skin, and cure results. My friend, Professor Chiene, explains its action as not tending to disturb the young layer of epithelial cells; these are thus permitted to pass through the stages of normal cornification without interruption, and compares it to his plan of healing an ulcer by placing over it a piece of tinfoil, which, equally unirritating, does not on its removal tear away the pellicle of epidermis, which, starting from the margin, spreads as a film over the denuded surface. Where, then, expense is not a serious objection, this treatment with zinc ichthyol salve muslin is one of our best methods, in many cases curing our patient by giving as entire rest as is perhaps possible to his skin.

So far, reference has been made to examples where it is not necessary to do any more than rest the part; but there are instances where such partial measures are not sufficient. Where eczema is already extensive, where large areas of the trunk or the lower limbs are involved, or threaten to become so in no long time, then confinement to bed is imperative. By placing our patient in the horizontal position, the blood stream pursues a placid course, the strain on the heart and vessels is at once taken off, while at the same time the temperature of the external surface is maintained at or about that of the internal organs, and friction and compression, or irregular pressure, are all done away with. The act of undressing is often cited as the period of commencement of itching. This is no doubt due in part to exposure to a cooler atmosphere; but partly also to setting free certain parts from constriction. This may be merely linear, as by garters or strings, or more general by waistcoats or corsets; but in either case the part so circumscribed is forthwith flushed, seen as a reddening on inspection, and with the returning blood the sensation of itching is excited. Dressings, too, which were inapplicable with the day clothes on, can now be easily coaptated; and if the facility for scratching is greater, the demand is lessened. In all cases of widespread eczema, therefore, either actual or threatening, confinement to bed is almost essential.

Before leaving the subject of eczema, one other point may be alluded to. We have seen that rest in general is obtained by alternation of occupation. It sometimes happens that a case of eczema, confined to bed and carefully treated, ceases to further improve after a considerable degree of progress has been attained. When this is the case, it is not infrequent that cure rapidly follows an entire change. The patient is sent home, the ordinary pursuits are again engaged in, and recovery is uninterrupted. The rest has done its work, and the time for activity has come.

In acne, again, the question of how we can best procure repose for the skin comes prominently forward, but is a much more complex one than is offered for our solution in most cases of eczema. As to the primary difficulty in acne, the researches of Unna have pretty well placed us on sure ground. We have to deal with "a superficial hyperkeratosis of the epidermis, which, extending to the follicle mouths, leads to the formation of comedones." We all recognise that the worst examples of acne are to be encountered in those subjects whose skins are coarse, thick, muddy, and pale, yet in them the acne is a transitory matter; it will in time cease its troubling, no doubt at the expense of indelible scars and much disfigurement. Yet the thick skin remains for life, the superficial hyperkeratosis of the epidermis is permanent. It is the epoch of developmental activity, that between puberty and manhood or womanhood, which is the period *par excellence* of acne. To my mind the micro-organisms which have been invoked as the essential causes of acne, are mere contributory factors; they determine the access of suppuration, but they are not the source of the comedo, though no doubt a component part of it. Hence treatment in acne has several sides. On one hand we must endeavour to thin down the abnormally thick epidermis. This is effected by various methods, in accordance with the degree and the resistancy of the integument. Sometimes ointments which contain salicylic acid, soap, and sulphur, as in the admirable one of Boeck, suit our purpose, or it may be necessary to have recourse to the resorcin desquamating paste suggested by Unna, or to the application of his resorcin or salicylic plaster muslins. At the same time the sulphur nullifies the pus-determining properties of the micro-organisms. But all this time it is necessary to watch over the evolutionary movements which are going on, and to direct these as far as we can in their proper channel, repressing any excess, and correcting any derangements which may exert a reflex influence.

Certain skins exhibit an exaggerated sensitiveness to light, but to only one of the methods in which such react will reference be made at present. Some individuals, particularly those with reddish hair, freckle readily during the brighter part of the year. This impressibility may be congenital, the result of changes due to age, or acquired as the consequence of excessive exposure to intense radiation. There can be little doubt that these freckles are an effort on the part of nature to protect areas which are from some cause more than usually delicate, to impart rapidly to limited spots the same safeguard which the progress of the ages has given to the darker races of humanity. The researches of Bowles have proved that it is the chemical rays which are thus active, and though their effects are most pronounced on uncovered parts, they are not restricted to these. They in this respect correspond to the X-rays, since freckles are met with on portions of the body on which the sunlight never impinges directly for any length of time, if at all. The most remarkable example of this susceptibility occurs in xeroderma pigmentosum. Not only have we intense freckling, but dryness and hyperkeratosis, at first diffuse, after a time taking on a warty and then a carcinomatous degeneration. Unna has thrown out the suggestion that, by due protection from the chemical rays, the freckling might be modified in this melancholy if rare disease, the further malignant changes postponed or arrested, and amelioration if not cure obtained. A case of this kind has been under my care for two years and a half, which I hope to show you shortly, and in it we have been able to check the advance almost perfectly. An ointment, stained brown by the addition of raw umber, has been pretty constantly applied to the face; a dark brown veil worn whenever the child, now 6, has gone out; and the warts on their earliest appearance treated with salicylic collodion. In this way fairly perfect rest has been obtained for the abnormally tender skin.

The inquiry as to how to secure rest when parasitic agencies are to blame, has been left to the last. At the present moment the trend of investigation is to try to find an organism which can be credited with the causation of every cutaneous disease. The effort is a laudable one, for in due time it will demonstrate which ailments are, and which are not, parasitic in origin. Hence, in this tentative stage, too much stress is very probably laid on the accidental presence of micro-organisms which are not pathogenic. Take the case of seborrhœa. Is that to be ascribed to micro-organismal action, either direct, by toxins, or chemotaxis? Is the organism which sets up the seborrhœal flux the same as that which occasions the dermatitis, or the alopecia? The following instance, viewed from the purely clinical side, exemplifies the intricacy of the problem. A man of 31 consulted me for a too copious fall of hair, which he feared would occasion baldness, of which there was so far no appearance. His hair was dark and plentiful, but there was a considerable amount of seborrhœa in the form of branny, greasy scales, distributed pretty uniformly over the scalp. There was no loss of mobility on pinching or moving it, nor did the hair come out readily on pulling. By the employment of a salicylic and sulphur pomade, the seborrhœa had entirely disappeared in the course of a month, but the hair still fell out too abundantly. Nine months afterwards there had been no return of the seborrhœa. The scalp on examination did not exhibit the faintest trace of scale, it was smooth and uniform, and the horny surface in the most perfect condition. The hairs, too, were well nourished, yet the fall continued, and there was certainly a degree of thinning, though not yet to a marked degree. If Sabouraud is correct, that the bacillus he has discovered is the cause of seborrhœa and seborrhœic alopecia, how can we explain the complete cure of the seborrhœa in this case, the healthy state of the scalp, and yet the persistence of the loss?

There is an entire consensus of opinion that erysipelas, regarded as a medical disease, is caused by the streptococcus of Fehleisen, giving rise to a spreading inflammation of the skin, or mucous membrane, having contagious characters. The micrococci grow in chains in the lymphatic vessels and spaces of the corium, and are most numerous at and just beyond the extending margin of the disease, while in the earlier affected parts no living cocci are to be found, but in these leucocytes invade the lymphatic channels, and the organisms die. Unna, however, maintains that while this may to some extent be true of the cutis, that the process extends to the hypoderm, which swarms with cocci, both in the marginal and central zones. He believes that from its more constant and higher temperature, the subcutaneous tissue provides better conditions of nutrition for the coccus of erysipelas than the parts nearer the surface, as it is notoriously sensitive in this respect. While the streptococci, having gained entrance through some breach of continuity of the skin, grow in the lymph vessels of the cutis, the veins and capillaries are dilated and distended with red blood corpuscles, and in the arteries there is a large amount of coagulated fibrin. It is believed that the contagion may proceed from the desquamated flakes of epidermis, or may linger in the crusts, or attach itself to the dressings or bedding. The point is, that it is from the superficies that the danger of the spread arises. Now, since in the high temperature of the affected part we find the favouring element for the growth of the organism, and in the separation of the dead epidermis and débris the element of communication, we have a clear indication for treatment. Though constitutional symptoms manifest themselves almost consecutively with the onset of the disease, it is for a time a surface ailment. And there is one remedy at least which can, in the large majority of cases, strangle it, so to speak, at its birth, if used promptly and efficiently. This is ichthyol. Yet it is singular that in the most recent article on erysipelas which has appeared, the in all other respects admirable one by Mr. Watson Cheyne in Allbutt's "System of Medicine," no allusion whatever is made to it. I had ample opportunities of thoroughly testing it in the erysipelas ward of the City Hospital, and never once did it fail to afford immediate relief, and, if applied early enough, to check the further spread. As Leistikow observes: "If we cannot maintain that this reducing agent directly kills the streptococci, yet it is manifest that by it a process of contraction is initiated, so that the cocci no longer thrive on the altered soil." If thickly smeared over the inflamed area, as a 25 per cent. ointment, made up with prepared chalk and vaseline, a base much like that suggested by Sir Dyce Duckworth, and covered with a layer of cotton-wool, which has the double advantage of excluding the air and acting as a cushion to shield the very sensitive surface, an agreeable feeling of coolness is at once experienced, the further progress is arrested, and simultaneously the fever and other disturbances abate. The treatment of erysipelas by strong ichthyol ointments affords one of the best examples of medicinal rest to an inflamed skin that can be cited.

Only two more illustrations, drawn from the more frankly parasitic affections, and I have done. The treatment of pityriasis versicolor is well enough established, but the prevention of recurrences is scarcely such a simple matter. These very probably originate from small points having escaped treatment, and so acting as foci from which the disease once more spreads. Now, it occurred to me that if the entire surface of the body so far as covered by the clothes, that on which the disease flourishes, were thoroughly washed with a soap capable of thinning down the epidermis, the last traces might be got rid of. I therefore have been in the habit of directing my patients affected with pityriasis versicolor, after the course of treatment calculated to rid them of all evident traces had been carried out, to continue to wash for a week or two with a resorcin and salicylic acid soap, and in this way, so far as my experience enables me to state, a permanent cure has been effected. We have thus procured rest by eliminating the cause.

We sometimes meet with instances of pediculosis vestimentorum in elderly people, who are seriously anxious to be rid of the infliction. But there are some skins which seem to afford a specially favourable feeding and rearing ground for these obnoxious parasites. The patients may change their linen with exemplary frequency, may wash with carbolic or other soaps more or less distasteful to the insects, yet they reappear. It struck me that possibly, by utilising the property of sulphur to undergo slow oxidation at the temperature of the body, one might eradicate these pests. I therefore tried the plan of making such persons wear, in a bag made of some porous material, a number of fragments of sulphur next the skin night and day, after the manner of a reliquary. The method proved eminently successful, and I have been able thus to preserve the skin from the ravages of the insects, and arrest the annoying itching.

There are numerous other illustrations of the value of rest in cutaneous diseases which may occur to you, and to which reference might have been made. Thus, in the large range of syphilitic affections of the integument, rest is an important factor in cure. But my object has been more suggestive than didactic, and will have been fulfilled if I have been successful in enlisting your interest in what is by no means a minor point of detail.

THE CLINICAL ASPECTS OF ARTERIAL PRESSURE: SOME PHYSIOLOGICAL DATA BEARING ON THE CLINICAL OBSERVATION OF THE BLOOD PRESSURE.

By George Oliver, M.D., F.R.C.P.Lond.

(*Continued from page* 11.)

It is perhaps scarcely necessary to remark that the study of the blood pressure in normal man is an indispensable preliminary to the clinical observation of it, at any rate if this is to be anything more than merely empirical. Moreover, this introductory physiological study is all the more called for, because our knowledge of particular facts in regard to the blood pressure in normal man is but limited, and therefore there remains much of a definite character to be acquired and settled by further direct observation. Furthermore, until quite recently, the means of observation in man have been distinctly faulty, and consequently physiologists have preferred to rely on inferences derived from the general facts of the circulation, acquired by experimentation on animals rather than on the observation of data furnished by man himself. But apart from the mere settling of facts in this department of physiological observation, the study of them is particularly instructive to the observer whose practical inquiries are mainly clinical; for, though observing how well the physiological equilibrium of the circulation is maintained, as a rule, at all points by quickly responding adjustments, his interest is quickened by all those slight failures in accommodation so apt to manifest themselves now and then in health: such failures being but transitory approximations towards the pathological, which afford an insight as to how the permanent aberrations in disease are brought about. In this outline of my observations of the blood pressure in health, as determined by the hæmodynamometer, I propose in the first place to briefly touch on some general questions relating to arterial, peripheral, and venous blood pressures; secondly, to describe the effects of different physiological conditions on the arterial and venous pressures; then to point out some of the characteristic features of the venous pressure; and, lastly, to indicate the average limits of normal arterial and venous pressures.

I. Some General Facts pertaining to Arterial, Peripheral, and Venous Blood Pressures.—1. *The arterial pressure when not influenced by gravitation is uniform in all the arteries available for observation.*—Inasmuch as the area of observation includes the carotid on the one hand, and on the other the smallest superficial arteries in which pulsation can be detected, this position must seem to be somewhat heretical; for the accepted teaching of physiologists is to the effect that the mean blood pressure diminhes along the arterial tract from the heart towards the small teries and capillaries—that it is higher in the large central teries than in the small peripheral arteries. My observations rtainly do not accord with this view; for they show that the [illegible] certainly, apart from the influence of the heart, they are the general determinants of variation in the mean blood pressure—in the arterial pressure on the one hand, and the venous pressure on the other.

6. *The general relation between the arterial, peripheral, and venous blood pressures.*—In health the blood pressure is fundamentally the outcome of muscular action. On the arterial half of the circulatory apparatus we have a predominance of muscular tissue and a proportionately high fluid pressure; and on the venous side we have a minimum amount of the contractile tissue and a correspondingly low pressure. In the former the large preponderance of muscular fibre is, on the one hand, massed in the left ventricle, while, on the other hand, it is distributed in probably at least an equal aggregate amount among all the arterioles; and between the incessant clonic contractions of the former, and the tonicity of the latter, there is maintained a high and uniform arterial blood pressure. But beyond the muscular inhibition of the arteriolar region, the blood flows onward into the capillaries and veins robbed of three-fourths of its pressure, and in a stream of uniform but gradually diminishing force. The arteriolar influence is not, however, solely confined to the mere maintenance of a relatively high arterial and a relatively low capillary and venous pressure; for by variations in contractility it is a regulating factor in raising or in lowering the mean blood pressure in the arteries and in the veins. On the one hand, by further contracting, it augments the mean arterial pressure and diminishes the venous pressure; and, on the other hand, by contracting less, or in ceasing to contract, it lowers the arterial, and allows the venous pressure to rise. This general rule is, however, liable to some well-pronounced modifications, under conditions to be referred to later on. It therefore follows that observation of the venous pressure, when made alongside that of the mean arterial pressure, affords a useful criterion of the degree of peripheral resistance exerted by the arterioles; and such observation is, moreover, likely to prove valuable in the clinical estimation of that resistance—especially, too, as so far we have not possessed any means of estimating it, either directly or indirectly. The venous pressure is therefore but the residuum of the arterial pressure, a remainder that survives the arteriolar resistance, and is inversely proportionate to that resistance.

II. Physiological Causes of Variation in the Blood Pressure (Arterial and Venous).—I have made a fairly large number of observations in healthy subjects, on the effects of the following physiological conditions on the blood pressure, namely, gravity, posture, muscular exercise, mental exercise and emotional excitement, fatigue, excitation of respiration and effort, rest, digestion, beverages, temperature, and baths. In this article the leading results will be merely epitomised for practical purposes.

1. *Gravitation.*—In the text-books on physiology—even in those published in recent years—there are but few references to the influence of the force of gravity on the circulation; nevertheless it is a fact, which has been recognised for many years by physiologists.[1] Perhaps the paucity of these references is due to the self-evident character of the fact, which is moreover sufficiently confirmed by physiological and clinical observation. Recent workers have, however, brought it prominently under notice, and have furthermore demonstrated the potent influence of gravitation on the circulation, when the splanchnic vasomotor control is impaired.[2] Though the force of gravity is constantly in action—and moreover in powerful action—on the blood pressure in the arteries and in the veins, it neither favours nor retards the circulation through these vessels in any part of the body, so long as the vasomotor adjusting mechanism remains intact. As soon, however, as that mechanism becomes impaired, as in the conditions to be referred to later on, the powerful disturbing influence of gravitation declares itself in reducing the blood pressure in the upper portions of the body.

The hydrostatic effect of gravity on the normal blood pressure in the arteries and in the veins can be accurately measured in man by the hæmodynamometer. It should be 1·9 mm. Hg (or approximately 2 mm.) for every inch; and this rate of gravity variation has been verified by observation.

First, as to the evidence of the operation of gravitation afforded by the arteries. It has been already stated that the arterial blood pressure is uniform in all the accessible arteries (*e.g.* temporal, carotid, radial, ulnar, arteria-dorsalis pedis, etc.) when taken in the same horizontal plane; but a slight departure from that plane (such as two inches above or below it) suffices to vary the reading—the variation increasing exactly in proportion to the deviation. In an erect posture (sitting or standing), the same rule, of course, likewise holds good—the reading of the pressure in any artery, such as the radial, rising or falling according to the hydrostatic level at which observations are made. Furthermore, the pressure varies in the different arteries, according to their vertical relation to the source of that pressure (the ventricle); the temporal and carotid, for example, furnishing a lower reading than that of the radial—a reading which may not indeed exceed one-half that which is afforded by the arteria-dorsalis pedis. In other words, in the standing posture the blood pressure of the arteries of the head may be but one-half that of the arteries of the feet; and the pressure in the foot arteries in the upright position may fall to one-half when the subject assumes the recumbent posture, when gravity becomes negative.

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[1] See Kirkes, "Text-Book of Physiology," First Edition published in 1848.

[2] See Hill, *Journ. Physiol.*, Cambridge and London, 1895, vol. xviii.; Hill and Barnard, *ibid.*, 1897, vol. xxi.

The same fact is likewise apparent in the veins. The blood pressure of a vein on the dorsum of the hand or foot varies exactly according to the level at which it is taken. In the horizontal plane the venous pressure is equal in the hand and foot; but in the standing posture it rises in the foot to a very high degree. In an average case it will, for example, rise from 15 mm. Hg, in recumbency, to 135 or 140 mm. Hg in the standing posture; the difference being accounted for by calculation on the basis of 1·9 mm. Hg per inch, is therefore purely hydrostatic. Inasmuch as the venous pressure in the legs frequently exceeds in the standing posture the arterial pressure in the upper half of the body, it is certainly not surprising that the veins of the legs should so frequently become varicose. And inasmuch as the length of the column of venous blood is probably a powerful factor in the production of varicosity, it is, I think, not improbable that there may exist a causal relationship between the long-bodied and the long-legged and varicose veins.

These facts have an obvious practical bearing on the reading of the blood pressure; for observations should be invariably made as near the same level as possible. In taking the radial pressure in the erect posture (sitting), the xiphoid cartilage or the epigastrium is a convenient landmark; and in the recumbent position nearly the same gravity effect is obtained when the arm is extended on the same plane as that on which the body rests. Inasmuch as the small readings furnished by the veins are relatively more affected by gravity variation than all the higher readings of the arterial pressure, it is particularly important to observe this uniformity of position of the hand, in observing the venous pressure in the recumbent and in the sitting posture.

2. *Posture.*—Change of posture produces, in normal subjects, a range of difference in the arterial and venous blood pressures; the range, however, varies considerably in different individuals, and in the same individual at different times.

In subjects enjoying good health and condition, the erect postures (standing and sitting) furnish higher readings of the arterial and venous pressures than obtain in the recumbent position. Of the two erect postures, standing provides the higher readings; but the difference is, as a rule, somewhat less between them than between sitting and recumbency. As sitting is altogether a more convenient posture for observation, especially in clinical work, it is preferred to standing. An immediate fall in the blood pressures is observed when recumbency is assumed. The reduction of the arterial pressure is rarely less than 10 mm., is more frequently 15 mm., and is not unfrequently 20 or even 30 mm.[1] The arterial pressures (mean and maximum) decrease together, and maintain much the same relationship between them as obtains in the other postures. This fact does not suggest that there is any variation in vasomotor action in the different postures; for an increase of tonus in any particular posture would approximate the mean to the maximum pressure, and a reduction of tonus would lower the relative position of the mean pressure.

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[1] Other observers have ascertained that the arterial blood pressure falls with change of posture from the erect position to recumbency. For example, Schäfer

In the recumbent posture the reduction of the frequency and force of the heart's action to some extent suffices to account for the fall of the blood pressure throughout the whole arterial system. In the erect postures, the enormous rise of pressure in the arteries of the lower parts of the body is obviously due to the force of gravity; but the increase observed in the arteries of the upper half must of course be ascribed to some other cause. The unrestrained influence of gravity should lower the blood pressure in the upper portions of the body when in the upright position. The experiments of Leonard Hill have demonstrated "that the important duty of compensating for the simple hydrostatic effects of gravity in changes of position must be ascribed to the splanchnic vasomotor mechanism."[1] When the body assumes an upright posture, the integrity of that mechanism, therefore, completely counteracts the lowering effects of gravity on the arterial blood pressure in the upper portions. Observation, however, shows that that pressure is not merely maintained, but actually rises considerably as the recumbent body becomes erect. How is this postural rise to be accounted for? It has been hitherto referred to over-compensation on the part of the vasomotor mechanism. Some recent observations have, however, caused me to doubt if this be the sole cause. I have frequently observed, in myself and others, that while sitting so supported as to admit of relaxation of the muscles, the arterial and venous pressures will fall as in recumbency, and will instantly rise on again maintaining the body erect by muscular action; and furthermore, while recumbent, the pressures being at their lowest point, will at once go up when the muscles are thrown into a condition of static contraction, and will as quickly subside when the muscles again become relaxed. It would therefore seem that mere change of position does not suffice to account for the postural variation in the arterial pressure;[2] and that muscular contraction is a factor—if not a predominant factor—in the production of that variation. Moreover, the rise in mean arterial pressure in the erect postures is obviously not due to vasomotor contraction, for the venous pressure is increased enormously, and the maximum arterial pressure (due to the heart) is raised to the

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gives the difference between standing and horizontal as 10 to 15 mm. Hg (*Jahresb. u. d. Leistung. . . . in d. Anat. u. Physiol.*, Berlin, 1881).

[1] *Journ. Physiol.*, Cambridge and London, 1895, vol. xviii. p. 45.

[2] There is, however, a form of postural variation of the arterial pressure, to be subsequently referred to, which is solely caused by change of position, and is therefore an effect of gravitation.

same extent as is the mean pressure. These facts therefore point to cardiac stimulation rather than to over-compensation on the part of the vasomotor mechanism, as being the main cause of the rise of the blood pressure in the arteries of the upper parts of the body (*e.g.* radial, temporal, carotid) in the active postures.

A far greater alteration of blood pressure, in proportion to the total pressure, is produced by change of posture in the veins than in the arteries. For example, a venous pressure of 20 or 30 mm. in the sitting posture may fall to 10 or 15 mm. in recumbency, and may rise to 25 or 35 mm. in the standing posture.

The foregoing facts have an important practical application. In deciding on the blood pressure in any case, it is of course important to secure as much as possible uniformity in the physiological conditions. Therefore the observation should be made in that posture which eliminates altogether the disturbing element of muscular contraction, namely, in recumbency; and if the radial artery be selected, the arm should be extended level with the back. The reading thus obtained should be regarded as the standard blood pressure of the individual, the gravity condition being uniform, and all muscular action being in abeyance. But for clinical purposes this is not the only reading that should be taken; for it is often important to compare with it the record obtained in the sitting posture—the wrist then being on a level with the epigastrium. The additional light thus obtained will be subsequently referred to.

(*To be continued.*)

ACUTE PNEUMONIA OF CHILDHOOD.

By James Carmichael, M.D., F.R.C.P. Ed., *University Clinical Lecturer on Disease in Children; Physician, Edinburgh Royal Hospital for Sick Children.*

Acute pneumonia bulks largely in the mortality of children in this and other countries. The disease, not only on account of its frequency, but from the varied and complex nature of its clinical features, is one of great interest. In recent years much has been done to elucidate the subject, both from a clinical and pathological standpoint. Bacteriology has contributed largely to our knowledge of the disease. Its etiology, whether in the adult or the child, is essentially the same, and yet how dissimilar are the clinical pictures at the different periods of life. I purpose to give a short outline of our present knowledge of the disease as met with in early life, based mainly on hospital experience during late years.

Looking back to the earlier writings on the subject, and the observations of such men as Valleix, Billard, Trousseau, and Bouchut, we find wonderfully accurate accounts of the symptomatology of the disease, and also a description of the naked-eye appearance of the lungs on section, in its various forms. From want of pathological knowledge based on microscopic investigations, these older authors vainly tried to classify the pneumonias in different ways. Legendre, Barthez, and Bailly divided them into two varieties, based upon the possibility of inflating the lungs, and applying the hydrostatic test. The more modern division of the disease into lobar and lobular varieties still holds good as a general and rough classification; but is only serviceable as giving us an idea of the extent of the disease, and the general physical condition of the lungs, without affording any information as to the real pathological condition. In the present day, it is wonderful how microscopic investigation and bacteriological research have cleared up and simplified our knowledge of the subject. Quite a flood of light has in recent years been thrown in upon the disease, and its infective nature pretty clearly established, so that a new classification of the various morbid conditions met with, according to our present knowledge, would seem to be called for. The rôle which micro-organisms play in the disease, if not the main factor, is certainly a very important one, as without doubt the toxæmia resulting from their growth and development would appear to be not only the main factor in the production of the constitutional symptoms, but often the principal cause of danger to life. It is a well-known fact that in pneumonia the constitutional symptoms are often out of all proportion to the severity or extent of the local lesion in the lung. The frequency of cerebral symptoms, which often occur when only a limited portion of lung is affected, such as the apex, are often associated with profound toxæmia. Other effects of the toxin on the nervous system often manifest themselves, particularly on the heart centres, where rapid death may take place from heart failure, due apparently to this cause, rather than any direct action of the poison on the heart muscle, although the effect of a high temperature, before the crisis, no doubt tends directly to weaken the heart itself. Another cause which appears to produce heart failure has been lately pointed out by Bollinger,[1] who has noticed the occurrence of oligæmia, due in part to the drain from the blood resulting from the exudate; and in this connection he notes that leucocytosis is a favourable prognostic, as indicating new blood formation. Another point of interest with reference to the rôle played by organisms in the disease is in regard to its type and duration. In pneumococcus pneumonia the disease is of short duration, and the crisis generally well marked; whether this be due to the fact that the life history of this organism is a comparatively short one, or that an antitoxin is more rapidly produced than in the case of many micro-organisms associated with other forms, we do not as yet know.

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[1] *München. med. Wchnschr.*, 1895, Bd. xxxii.

Classification.—The most rational and scientific mode would seem to be that founded on the pathological anatomy and bacteriology of this disease, as shown in the annexed table. Recent bacteriological investigation shows that quite a number of organisms are found associated with this disease. Netter[1] gives the bacteriology in forty-two cases—in twenty-five primary cases Friedlander's coccus or pneumobacillus was found in ten; streptococcus in eight; staphylococcus in five; Fränkel's capsuled coccus in two. In seventeen of the cases there was mixed infection; thus in five, pneumococcus and streptococcus; five, streptococcus and staphylococcus; three, streptococcus and capsuled coccus; two, pneumococcus, streptococcus, and staphylococcus; one, pneumococcus and capsuled coccus. Similar results were obtained by Durck,[2] who also demonstrated that pneumococcus was the organism most frequently met with. Mosny[3] and Netter both agree that in cases marked by lobular distribution, streptococcus was usually met with alone or with pneumococcus; whereas those in which the distribution was lobar, catarrhal and fibrinous variety combined, one or other of the forms of pneumococcus, either Fränkel's or Friedländer's, organisms were generally found alone. In secondary pneumonias the micro-organisms are still more numerous and varied, according to the nature of the primary disease, and associated with the organisms peculiar to the primary disease, others, such as streptococcus, staphylococcus, and pneumococcus are met with, showing a mixed infection. Meunier[4] has investigated a large number of influenza pneumonias, in all of which Pfeiffer's bacillus was present, along with, in most cases, other organisms. In broncho-pneumonias of intestinal origin, both Sevestre and Lesage have demonstrated the presence of the *Bacterium coli commune.* In like manner, M. Darier,[5] who has investigated diphtheria pneumonias, and many other secondary forms, has found in the case of diphtheria Löffler's bacillus, either alone or associated with other organisms. In other diseases, such as pertussis, measles, scarlet fevers, erysipelas, and typhoid, similar results have been obtained, and in most of these diseases streptococcus was the predominating organism. Bacteriology thus demonstrates that the pneumonia of infancy can in no sense be considered a specific disease, in the sense that it is due to any special organisms, as similar, if not identical, pathological changes are produced in the lung tissues by various organisms. Grancher[6] in his treatise says: "The bacteriology of broncho-pneumonia is very complex . . . depend-

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[1] *Arch. de med. nav.*, Paris, January 1892.
[2] *Deutsches Arch. f. klin. Med.*, Leipzig, 1897.
[3] Thèse de Paris, 1891.
[4] *Arch. gén. de méd.*, Paris, 1897.
[5] *Compt. rend. Soc. de biol.*, Paris, 1885.
[6] "Traité des maladies de l'Enfance."

ACUTE PNEUMONIA.

PRIMARY.	SECONDARY.
Catarrhal Pneumonia.	Fibrinous Pneumonia.
Catarrhal. Fibrinous and Catarrhal.	=Pneumonia. =Pleurisy. =Pneumonia. +Pleurisy. } Pleuro-pneumonia.

DISTRIBUTION.

One or both Lungs. Lobular. Secondary—Primary (more rarely).	One Lung (generally). Lobar. Primary.

ANATOMY.

Bronchi thickened, exuding pus; alveoli and bronchi filled with desquamated epithelium and leucocytes, sometimes fibrinous material, alveolar septa thickened; surrounding emphysema. Consolidation incomplete. Pleurisy generally present—localised.	Air cells filled with fibrinous exudation, containing red and white blood cells and desquamated epithelium. Consolidation complete. Pleurisy present—general.

BACTERIOLOGY.

Pneumococcus—mixed infection; Streptococci, Staphylococci, Pfeiffer's Bacillus; Measles, Diphtheria, Pertussis. Tubercle Bacillus, Bacterium coli (Sevestre and Lesage).	Pneumococcus (Fränkel's, Friedländer's.)

ing on numerous pathogenous organisms, for whereas fibrinous pneumonia is associated almost invariably with pneumococcus, catarrhal pneumonia is produced by a great variety of infections."

Pathological anatomy.—In fibrinous pneumonia in the earliest stage there is simple engorgement, with congestion of the muscular network of the alveoli, the lung being still vesicular. This soon passes into the stage of solidification, in which the air cells become filled with fibrinous lymph and embryonic epithelial cells from the walls of the alveoli, as well as coloured blood cells and leucocytes. To this stage succeeds that of grey hepatisation, the fibrinous network begins to disappear, and the leucocytes show signs of commencing fatty degeneration. Fibrinous pleural exudation shows itself in the second stage, and is most copious when the third stage is reached and the lung becomes absolutely solid and non-vesicular. The pathological anatomy of catarrhal pneumonia presents a different picture. The lung is not solid but vesicular throughout. The surface, however, shows isolated lobules, or groups of these, prominent and of a purplish colour. Pleurisy is either absent or present, generally in localised areas. On section, the lung soon becomes of a scarlet colour, the surface shows irregular small areas of lobular consolidation of a more or less greyish colour, and when the finger is passed over the surface Hamilton describes the feeling like that of a frog's spawn. On squeezing the lung, catarrhal fluid exudes from the smaller bronchi and also from the inflamed lobules. Microscopic examination shows the air cells filled with mucous fluid and cellular elements. These cells are found to be germinating epithelial cells, which are rapidly thrown off from those of the alveolar wall and fill up the alveolar spaces. The older epithelial cells desquamate and rapidly undergo fatty degeneration. The whole process is essentially a catarrhal one. While the morbid conditions just briefly alluded to in the two forms are sufficiently distinct, the true fibrinous or lobar consolidation rarely presenting much variation, in the catarrhal variety the appearances are not always of such a typical nature; in many cases a condition akin to splenisation taking place in groups of lobules, or larger areas forming more or less solidified lung. On microscopic examination in these cases, the lung shows, in addition to the catarrhal process, more or less exudation of red and white blood cells into the alveoli and interstitial tissue, small blood extravasation being often visible underneath the pleura. In these cases the walls of the minute bronchial ramification are much thickened and infiltrated, and emphysema surrounding the affected lobules is generally met with to a greater or lesser extent in this form of the disease.

Of 142 cases of acute pneumonia in hospital practice in which recovery took place, 107 showed clinical features of a catarrhal nature, 35 of a fibrinous nature. In eighty-three of the catarrhal cases the disease ended by lysis, in twenty-four by crisis. In those of a fibrinous nature, thirty-five in number, one ended by lysis, and thirty-four by crisis. Both lungs were affected in fifty-three cases, one lung in eighty-nine cases; in nineteen, the right apex; in nine, the left apex—twenty-eight in all. The base was affected in twenty-seven, thirteen the right base, fourteen the left base. Mid-lung was affected in thirty-five, twenty-two on the right side, thirteen on the left.

Clinical types.—Based on the classification already given, two principal varieties may be noted, and each of these may be subdivided. Primary acute pneumonia is usually epidemic in its visitation, sporadic cases occurring at times, as in all other infectious diseases. The epidemic nature of the disease is well brought out in hospital practice, groups of cases being met with within short periods, at other times the hospital wards being free from the disease. It is highly probable that the disease is more or less infectious under certain circumstances, but in my hospital experience I have not been able to obtain sufficient evidence to adduce proof of this. During the last six months, in the Royal Hospital for Sick Children, we have had a large number of cases, illustrating all the different types, from acute infective bronchial catarrh to the fully developed disease, showing either the fibrinous form with lobar distribution, or the lobular form more or less distributed through both lungs. With reference to acute bronchial catarrh, without any clinical evidence of involvement of the alveoli or capillary bronchi, my experience points to the occurrence of these cases more or less frequently during pneumonia epidemics. The clinical features of such cases show sibilant rhonchi and crepitant râles in the larger and medium tubes, with a temperature seldom rising above 103°, the cases generally ending by crisis or rapid lysis within a week or ten days, when the child becomes convalescent and gets rapidly well. None of the cases observed ending fatally, and no expectoration being procurable, I have been unable to determine the nature of the organism causing the disease, but the probability of pneumococcus infection seems most likely.

Fibrinous pneumonia.—This form shows two well-marked varieties, one in which the pneumonia is a prominent factor, the other in which pleurisy predominates so as to mask the pneumonia to a great extent (pleuro-pneumonia). In both forms pleurisy is generally distributed; in the first variety, the ordinary lobar pneumonia, the pleural exudate is minus, and in no way obscures the well-marked typical signs of lobar consolidation. On the other hand, when the fibrinous pleural exudate is very copious, the signs of lung consolidation are less prominent, those of pleural exudation more so; the breath sounds being less distinct and the dulness remaining long after the crisis, the case becoming more or less chronic in its duration and ending by lysis. The occurrence of empyema is a well-known sequel of fibrinous pneumonia in children. Fibrinous pneumonia is a much less fatal disease than catarrhal pneumonia, and is almost invariably primary in its nature. It pursues a well-marked and typical course, ending in crisis at the end of a week, and is essentially a pneumococcus infection, usually attacking previously healthy children. The pulmonary exudate is essentially fibrinous in its nature; the distribution of the disease, lobar and sharply defined in one or other lobes of the lung, contrasting markedly with the diffuse and irregular distribution of the catarrhal variety.

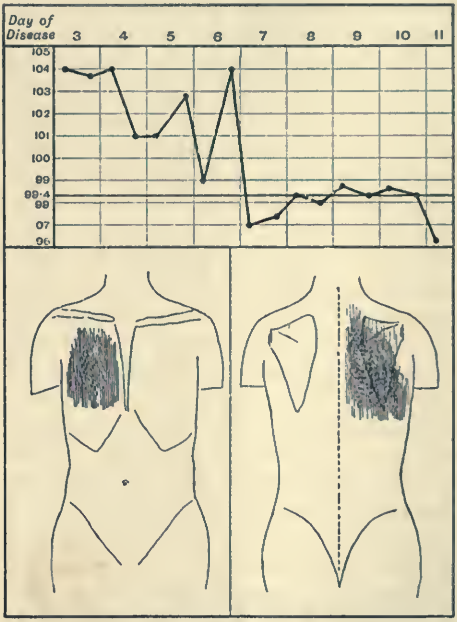

FIG. 1.—P. G., æt. 6; fibrinous pneumonia.

Catarrhal pneumonia, or broncho-pneumonia.—The former term seems preferable, as indicating the pathological nature of the morbid condition. Whereas fibrinous pneumonia is almost invariably a primary affection, this disease is either primary or secondary, statistics showing that the two varieties are met with in almost equal proportions. The primary cases show either a pure pneumococcus infection, or several bacteria may be found. The secondary infections are various, and generally mixed, streptococcus being the most frequent organism. Reference has already been made to the nature of the other infections. This is essentially the pneumonia of infancy, being much commoner at the earlier than the later periods of child life. It is much more fatal than fibrinous pneumonia, and is a disease of indefinite type and duration, coming on insidiously, in marked contrast to the sudden onset of fibrinous pneumonia. The pathological changes in the minute bronchi and alveoli are essentially catarrhal, but in a large proportion of cases a fibrinous exudate complicates the catarrhal process. The pathological changes in the lung are irregularly distributed, generally in both lungs, and the lesion not sharply defined as in the purely fibrinous form, the physical signs of bronchial catarrh being usually present. The duration of the disease is quite indefinite, varying from ten days to many weeks, and resolution is slow, with a tendency to chronicity. Relapses are not infrequent. When the case becomes chronic, interstitial changes take place in the lung, and tuberculosis may ultimately complicate the disease. Pleurisy is generally present to a greater or lesser extent, and is locally rather than generally distributed. Empyema may result from pneumococcus, streptococcus, or mixed infection.

SYMPTOMS AND PHYSICAL SIGNS.—*Fibrinous form.*—The clinical features of this form are so well defined and regular, and so well known, that I shall only make passing allusion to them, preferring to dwell more fully on those of the catarrhal, as being more interesting and difficult to appreciate. The onset of fibrinous pneumonia is sudden, often ushered in by vomiting in place of rigor, more rarely a convulsion. The temperature soon runs up to 103° or 104°, and remains without much variation till the fifth or seventh day, when a crisis takes place. Should this not occur, it is an indication either of further involvement of the same or opposite lung, or some other complication, often extensive pleural effusion (pleuro-pneumonia). The physical signs of this form of pneumonia in a typical case are distinct and constant.

The *percussion note* becomes rapidly impaired during the process of consolidation over the affected area, the note over the non-affected portions of lung and in the opposite lung often showing hyper-resonance. The auscultatory signs are first those indicating pulmonary congestion, high-pitched but distinct respiratory murmurs; sometimes, however, the breathing may be so distant as to be scarcely audible. The true characteristic crepitation, heard only at the end of the inspiratory act, may or may not be audible. If heard, it may only be detected for a few hours, after which all moist sounds disappear. When consolidation becomes complete, bronchial breathing is audible, as air has ceased to enter the affected portion of the lung. The vocal resonance is increased and of a bronchial character. Friction sounds may or may not be heard. As resolution takes place the respiration becomes less bronchial and more vesicular, with coarse crepitant râles (*redux*). Although this regular development of physical signs is the rule, it not unfrequently happens that the signs are delayed, and when detected, perhaps not till the crisis has taken place, are very limited and out of all proportion to the constitutional symptoms, showing that the general pneumoccocus infection really constitutes the disease more than the local condition; hence the applicability to this affection of the term pneumonic fever.

Catarrhal form.—This is essentially the pneumonia of infancy. The question why a similar infection should produce in an infant a catarrhal pneumonia, and in a child over five years of age or an adult a fibrinous pneumonia, is of much interest. The answer is not far to seek. The infective micro-organism attacks the most vulnerable part of the respiratory tract, which in an infant is the minute bronchi and alveoli of the lung. A little consideration of the developmental processes going on in the infant lung elucidates this. From the investigations of Northrup and others, it has been shown that in the late fœtus, at five months, the alveoli have not yet appeared; the ultimate bronchial ramifications end in a loose connective tissue, which later on becomes thinner and stronger, and in which the vascular network is distributed. Over this, flat epithelium soon becomes developed, and can ultimately be differentiated from the columnar variety lining the minute bronchial ramifications. It is not until the fourth or fifth year that the delicate tissues constituting the alveoli of the lung are fully developed. Prior to this time the air cells are much smaller than in the adult, their walls relatively thicker, the interstitial tissue being larger in amount. The blood vessels of the alveolar walls are likewise very abundant. The connective tissue cells in the stroma and also the epithelial cells are very numerous and readily proliferate. Such being the anatomical conditions of the infantile lung, it becomes evident that a ready explanation is afforded of the pathological conditions produced by disease in those delicate growing tissues; the greater vascularity of the walls of the alveoli and the abundance of their epithelial contents, the immature nature of the cells, and also the cellular elements of the interstitial connective tissue, forming a group of anatomical conditions possessing less immunity to the infective process than any other portion of the lung tissue.

The symptoms and physical signs form a marked contrast to the constancy and regularity of those of fibrinous pneumonia, pure and simple. Grancher[1] introduces his description of the clinical picture of this form of the disease by generalising its features in the very apt terms, "multiplicité, complexité, mobilité." In order to appreciate the varied nature of the clinical characters of the disease, it is necessary to premise that there are three pretty distinct varieties—(*a*) Those without signs of consolidation; (*b*) with small areas of consolidation (lobular distribution); (*c*) large areas of consolidation (lobar distribution).

I shall first refer to symptoms, and then describe shortly the physical signs by which we are aided in recognising the nature of the disease.

Symptoms.—These are much more constant than the physical signs, and show a marked similarity in all the varieties, and a common ground, enabling the physician with tolerable certainty to arrive at a diagnosis without the aid of physical signs. When the child is stripped and inspected, it is noticed that there is more or less respiratory embarrassment and probably cyanosis, the alæ nasi are in active motion, and the respiratory movements altered, showing more movement of the chest walls than normal in the young child, with more or less inspiratory retraction at the lateral bases and diaphragmatic insertion. The pulse respiration ratio is perverted, the respiration running up to sixty or eighty per minute. The temperature ranges from 102° to 104° or higher, and is of an irregular type. With such a group of symptoms you may predict with tolerable certainty that the auscultatory signs will reveal the presence of catarrhal pneumonia.

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[1] "Traité des maladies de l'Enfance."

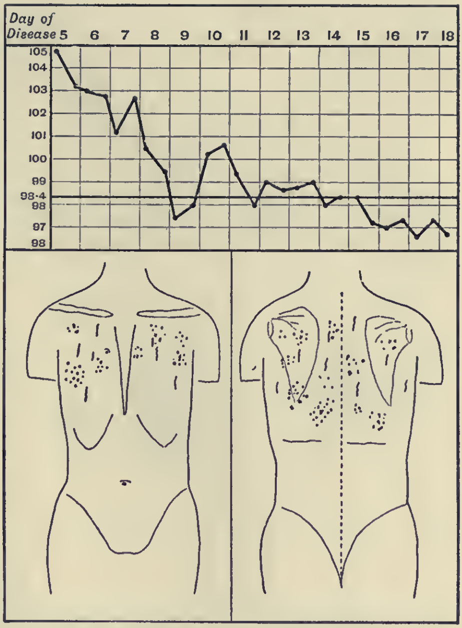


FIG. 2.—R. S. F., æt. 2½; primary catarrhal pneumonia.

Physical signs.—These vary infinitely, according to the physical conditions of the lung. It may be at once stated that auscultation is the means by far the most reliable of diagnosing the pneumonic areas, percussion, except in large areas, being unreliable, for various reasons hereafter to be noted.

It is well known to pediatricians that some of the most severe and dangerous cases of catarrhal pneumonia, such as those seen after measles or in acute tubercular infection, present no physical signs of consolidation of the lung. Clinically, these cases may be divided into several varieties. I have already alluded to the *first variety*, a pneumococcus or mixed infection of the bronchial tubes without evidence by physical signs of implication of the air cells. This runs an acute course, ending in crisis or rapid lysis. In these cases the physical signs are those of ordinary bronchitis, and need not be further alluded to. The ordinary forms in which all the branches of the bronchial tree are involved, as well as the alveoli, may be either primary or secondary. Here the temperature chart exhibits the usual type of acute catarrhal pneumonia, with the rapid respiration and cyanosis. The percussion is generally resonant. The auscultatory signs are sibilant rhonchi, with coarse and fine crepitant râles, more or less distributed over one or both lungs. Over certain areas of the lung, where the alveoli are most affected, finer râles are heard in corresponding portions of lung. These râles are highly characteristic to the practised ear, being audible chiefly during the whole of the inspiratory act, but frequently during expiration as well. They take their origin in the minutest bronchial ramifications and alveoli. The general character of the respiration in these cases is vesicular, but, owing to the congested condition of the lung, the breathing is often feebler than normal.

The *second variety*, where the distribution of the pneumonic areas is lobular, is characterised by signs indicating localised consolidation in patches varying in size. Even in this variety the information gained by percussion is often unreliable. Auscultation, on the other hand, soon detects the site of the affected portions of the lung. In using the stethoscope in these cases, every inch of ground, so to speak, must be gone over, in order to detect the locality of the pneumonic area. Sometimes these are so small as to be included only by the end of the stethoscope; if the instrument be moved away from the spot, the characteristic signs are lost. These small pneumonic areas tend to enlarge and coalesce with other and neighbouring patches, so as to form larger consolidations, over which the physical signs become more and more distinct. The percussion note is more or less impaired over the affected portions, in proportion to the size of the areas involved, and their proximity to the surface. In some cases there is little or no impairment of the percussion note, owing to the surrounding healthy lung tissue; and if there be much emphysema, the note may be even hyper-resonant in places. It will thus be evident that in discovering these small lobular distributions of affected lung, the stethoscope must mainly be relied on. It is often difficult to impress on students, in discussing this form of

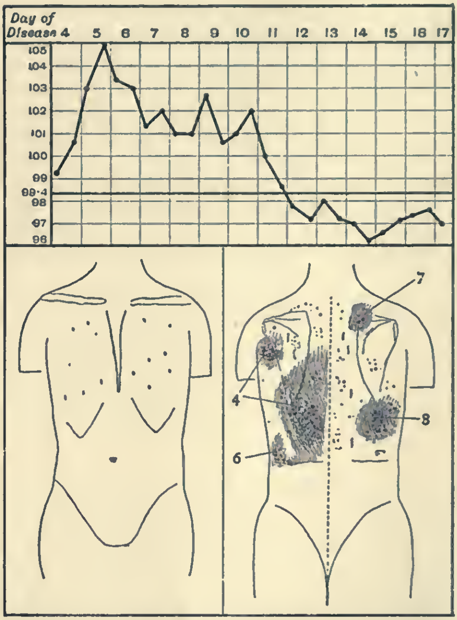
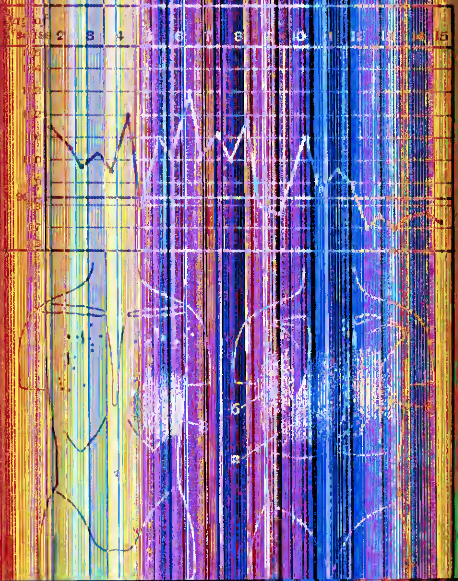


FIG. 3.—A. G., æt. 18 months; primary catarrhal pneumonia.

pneumonia, the necessity of eliminating dulness on percussion as a reliable or constant physical sign. The auscultatory signs over the affected portions are broncho-vesicular breathing, with increased crying resonance, and moist sounds of the same character as those [illegible] the former variety, with this difference, that some-[illegible] centre of the affected lobular areas there are few [illegible] accompaniments being more numerous and distinct [illegible] peripheral parts. The vocal fremitus is either [illegible] slightly increased.

[illegible] variety with larger areas of affected lung and lobular [illegible] physical signs are more distinct and easily appre-[illegible] ny cases [illegible] ond diff[illegible] cal signs [illegible] nguishing [illegible] m from [illegible] ous one [illegible] accomp[illegible] tunes [illegible] ere the [illegible] bronchial [illegible] omplete [illegible] olidation [illegible] emem[illegible] ecurrin[illegible] nvolved [illegible] r less [illegible] may [illegible] nilat[illegible] neumoni[illegible] usually [illegible]



sharply defined [illegible] nous pneumonia [illegible] tant [illegible] present during [illegible] course of the [illegible] less marked, in fact [illegible] proportion is the extent of the [illegible]

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Before I [illegible] word [illegible] fibrinous [illegible] cases [illegible] about 60 per cent., this being largely due to the fact that this is the form which attacks children under two years of age, that a large proportion are secondary cases, and that complications are more numerous, and the tendency to chronicity and ulterior destructive changes in the lungs frequent. When this form of the disease becomes chronic, tubercular infection is also apt to occur. The destructive changes in chronic broncho-pneumonia are generally of an interstitial nature, ending in fibroid changes. Empyema, although not so frequently met with as in the fibrinous forms, is by no means uncommon. It is most frequently of a localised nature, sometimes very limited, only containing a few drachms of pus. Such small accumulations, when detected early, are easily and successfully treated by aspiration alone. One of the most annoying and frequent complications of broncho-pneumonia is intestinal catarrh, which often proves troublesome and intractable.

Treatment.—As yet we have no special treatment for acute pneumonia. The antitoxin has yet been discovered, but this is a line of research well worthy of attention. All we can do is, to treat each patient according to the special needs of the case, meeting symptoms as they arise by rational means. In all cases hygienic measures, including diet, are all-important. The patient should be in a well-ventilated room of mean temperature. I find a tent-bed invaluable, hung round inside with wet towels sprinkled with eucalyptus or creasote, or other antiseptics. In very severe cases, with much cyanosis, the inhalation of oxygen mixed in the air of the tent often proves of signal benefit. The dieting should be conducted on the general principles applicable to all febrile affections—light, easily digested nutriment, in such quantity as the patient can digest. Over-feeding is harmful as likely to bring on vomiting and diarrhœa, which are complications always to be dreaded. Continuous and routine poulticing is now discarded, poultices being used, as other therapeutic means, according to the necessities of the case. A stimulating sinapism, occasionally applied all over the chest for half an hour or an hour, is often very serviceable, this being replaced by a pneumonia jacket of Gamgee tissue; when the temperature is high and the skin is not acting, a moist continuous poultice of soft flannel and jaconette, moistened with boracic solution, is very grateful to the patient. By keeping up a local as well as general diaphoresis, relief is given to the engorged lung, whose blood vessels are in a state of hyperæmia and permanent dilatation, the cutaneous blood vessels, which are in the opposite condition of high tension, being thereby relieved.

Drug treatment.—As no drug yet known has any special influence on the disease, we must treat the patient by endeavouring to assist nature in her efforts to maintain a compensatory physiological balance in the functional activity of the various organs. In the reference already made, in regard to dieting, I have indicated the necessity of due attention to the *digestive functions.* The respiratory embarrassment can be best relieved by keeping up a continuous local and general diaphoresis, as already indicated. This should be assisted by the exhibition of non-depressing diaphoretics, such as liq. acet. ammoniæ and sp. etheris nitrosi, a combination which has well stood the test of experience. The nitric ether is most valuable in relieving the general vascular tension apart from that of the lung. Alcoholic stimulants are of great value, especially in broncho-pneumonia. They must be administered in suitable doses, according to the exigencies of the case and the state of the pulse. Next in importance as a stimulant I regard strychnine. The indications for its use are similar to those of alcohol, and it may be given with advantage at the same time. I regard it as of more value in the acute respiratory affections of children than in adults, on account of its action on the cardiac respiratory centres and cardiac ganglia. In children it is well known that the nerve tone is more rapidly lowered from acute disease than in adults, hence the great importance of anticipating this by the timely use of such a remedy.

The use of belladonna, in certain cases of acute respiratory affections of infants, is one of the most striking therapeutic facts I know of. The cases in which it is indicated are those, particularly of infants, attacked with acute congestive bronchial catarrh in the early stages. It is well known that in these cases there is great respiratory embarrassment, due partly to the congestive conditions, which is accompanied by more or less bronchial spasm and collapse of the lung. Its action in soothing the afferent and efferent nerves in the bronchial walls, and stimulating the respiratory centre, is most marked. It has no beneficial effect in the later stages where the alveoli are involved, but its timely use in the earlier stages of the disease is attended with striking results. My remarks on the drug treatment of acute pneumonia would be incomplete were I not to refer to digitalis, and I only do so to condemn its use as a *routine* remedy. I do not for a moment undervalue the importance of employing this drug in cases where its use is clearly indicated—feeble pulse with weakness of the left ventricle and diminished arterial tension; such conditions obtain occasionally but not frequently in the advanced stages of acute catarrhal pneumonia. In fibrinous pneumonia with large lobar consolidation, on the other hand, the condition of the arterial system clearly contra-indicates its use. The state of the blood vessels in the affected part are those of distension and paralysis, the systemic arterial circulation being in a high state of tension, with an enfeebled and distended right heart. In such cases we have no proof that digitalis has any power in restoring the tone of the blood vessels in the affected part. It cannot act on the right heart without more powerfully, on account of the greater muscular area, stimulating the left ventricle to congest the affected lung by "diminishing the vascular area" (Loomis). Heart failure in lobar pneumonia, as I indicated in an early part of this paper, would appear to be due to two principal causes—the depressing effect of the toxins on the nervous centre, and of a high temperature on the heart muscle. If this be so, there are no indications for digitalis, but rather for such remedies as act directly by stimulating the nerve centre on the one hand, relieving the local hyperæmia on the other. I believe that local and general diaphoresis, occasional purgation, and remedies which stimulate the cardio-respiratory centres, are the most appropriate means of combating this condition.

Antipyretics.—The use of large doses of phenacetin or antipyrin are in my experience not useful, often harmful, in both forms of pneumonia. In small doses, however, they are often of service in allaying nervous irritability and restlessness. In hyperpyrexia we must trust to the wet pack, or tepid bath, or the application of cold by ice-bags, or otherwise.

Expectorants.—I regret to find that even yet in these more enlightened days, such remedies as ipecacuanha, tartar emetic, and squills are still prescribed by some physicians. There is no indication that I know of, but a distinct contra-indication for their use. Children suffering from pneumonia require rather stimulation than the exhibition of depressing remedies such as these.

PERSONAL EXPERIENCES IN THE TREATMENT OF ENLARGED PROSTATE.

By Alexis Thomson, M.D., F.R.C.S.Ed., *Assistant Surgeon to the Royal Infirmary and Lecturer on Surgery, Edinburgh.*

In view of what has been written on this subject, it seems undesirable to attempt to review the subject as a whole; I shall therefore restrict myself to personal experiences, as indicated in the title of this paper.

From a large number of cases of senile enlargement of the prostate which have been under my care during recent years, I propose to communicate the particulars of six in which a "curative" operation was performed; it is, of course, impossible that any valid conclusions can be drawn from so small a number, but it seems to me to be the duty of every one to record his own experience in the treatment of a disease regarding which there exists so much difference of opinion. It may be stated at the outset, that cases in which the patient pursues the even tenor of his life under the ægis of the catheter, are excluded from the present inquiry. We are here concerned with those in which, after the existence of prostatic symptoms for a varying period of months or years, with or without the establishment of catheter life, the patient is drifting into a condition of illness and danger, with increasing residual urine, increasing difficulty and pain in the use of the catheter, and it may be the existence of complications, *e.g.* cystitis, false passages, hæmaturia, orchitis, and constant imminence of renal or of general septic infection. Prostatic cases are not uncommonly in this condition when they are first brought under the observation of the surgeon. Until recent years, it was the custom for him to aim at tiding the patient over the immediate crisis, by what may be described as medical measures, along with skilful catheterisation at intervals, or continuous, resorting only in the more serious cases to operative drainage of the bladder, as introduced and practised by Annandale and Harrison. At the same time, it was well known that a recurrence of the crisis was to be anticipated sooner or later and upon repeated occasions, until finally the patient would fall a victim to the long-anticipated urinary infection; hence the dictum came to be, if a patient with a badly behaved enlarged prostate lived long enough, *i.e.* did not succumb to some other lesion, he would die of surgical kidneys or of septicæmia.

While gratifying results have been obtained from drainage of the bladder, by Annandale, Harrison, and others, the method is not applicable in anything like a large proportion of the cases which present themselves, either in hospital or private practice; so much depends upon the continuous supervision of the fistula and of the necessary apparatus, both on the part of the patient and of the surgeon, that even where established successfully, there is still the risk of infection and of a recurrence of the crisis, similar to that which attends the failure of catheter life, so that the procedure in question is practically reserved as a palliative measure, for cases in which there already exist evidences of grave septic infection, while at the same time the possession of a vesical fistula cannot be regarded as an ideal state of affairs. Surgical treatment in the majority of cases should aim at what may be described as a radical cure, *i.e.* at eliminating the obstructing and progressively enlarging prostate, and in this way freeing the patient from the absolute sway of the catheter, and at restoring the functions of the bladder, so far as this may be possible.

Bottini's operation, which consists in destroying or in dividing the obstructing prostatic tissue by the galvano-cautery, has been practised by its author for the last twenty-two years. He has had only two deaths in a series of eighty cases. The procedure was brought before the Edinburgh Medico-Chirurgical Society some years ago by a distinguished assistant of Bottini, but, so far as I am aware, it has been little practised in this country. Freudenberg of Berlin has employed it extensively, and corroborates all that has been claimed for it by Bottini. The prejudice with which it is regarded by many, results from the difficulty in safely regulating the operation, until considerable experience has been acquired in the manipulation of the instruments employed.

Suprapubic prostatectomy is rightly regarded as the most certain curative procedure, where the difficulty in emptying the bladder depends upon an intravesical projection of the prostate, and especially where there is evidence of the existence of a pedunculated middle lobe, which may lend itself to removal with the scissors or tumour forceps. The risk of the operation would not appear to be appreciably greater than a simple suprapubic cystotomy, and is not a serious one, in the absence of already existing septic infections of the bladder and kidneys. Only one case has come under my care in which this procedure was indicated; one in which a stone lay behind a projecting middle lobe. The particulars are briefly as follows:—

A vigorous schoolmaster, æt. 57, was sent to me by Dr. Peterkin of Forfar, with symptoms of stone in the bladder. Twenty-two years before, he had passed a small calculus by the urethra. His present ailment was of twelve months' duration, and was characterised by frequency of micturition and hæmaturia, both aggravated by exercise or jolting. He had had, at any rate, one attack of retention, during which the urine had to be withdrawn thrice daily. On admission to the Deaconess Hospital, he was able to pass an ounce or two of water, at frequent intervals. The urine was acid, and deposited abundant mucus and pus. The sound, with its beak rotated downwards, struck a rough fair-sized stone lying on the floor of the bladder. A soft catheter had to be introduced nearly 11 in. before urine escaped. Per rectum, there was apparently a very moderate degree of general enlargement of the prostate. The existence of a projecting middle lobe was inferred as the most probable explanation of his dysuria, (1) in the absence of general prostatic enlargement; (2) from the increased length of catheter required to evacuate urine; and (3) the manipulations of the sound required to strike the stone. The amount of residual urine varied from 5 to 15 oz. In November 1895 I opened the bladder by a horizontal incision above the pubes; the stone was found lying behind a semi-pedunculated middle lobe, of the size of a large cherry, and was easily removed; the middle lobe was then made to project by two fingers introduced per rectum, and its neck torn through with the angled tumour forceps. Sutures were passed through the edges of the wound in the bladder, before the latter was irrigated with hot lotion (boracic), as I had found in a case of ruptured bladder that the contraction caused by the hot fluid may render accurate stitching very difficult. A catheter was tied in the bladder, and gave exit during the next twenty-four hours to a large amount of bloody urine. Thereafter, the urine escaped from the wound above the pubes, apparently in the first instance because the catheter became repeatedly blocked with clot, and the bladder was allowed to become over-distended; a little later the sutures gave way altogether.

The entire wound opened out and became the seat of a sloughing cellulitis, which caused a protracted illness, and prevented the wound closing for several weeks. During this time the urine was turbid and slimy; he was taking sandal-wood oil and salol in full doses. Four months from the date of operation he wrote that he was making water as easily as ever he did in his life, every three hours during the day, and twice or thrice during the night, and that it was quite healthy; that he had passed small calculi by the urethra on several occasions; these calculi were apparently derived from the kidneys, chiefly from the right, judging from the unilateral colic. His diet may have been partly to blame for the continued lithiasis, for, according to his own statement, the only thing he never tired of was brandered steak, and that he was in the habit of eating three times in the day. Six months from the operation he had only to rise once in the night, and even that was unnecessary, while during the day he usually made water every four hours or so. Three months later he passed another small calculus, after repeated slight attacks of left renal colic. In March of this year (two years and five months after operation) he succeeded in passing a uric stone, 1 in. in length and nearly ½ in. in breadth; this caused severe colic and evanescent hæmaturia, while passing down the left ureter; it remained eight days in the bladder, with occasional abortive attempts to enter the urethra; finally it entered the pipe, on suddenly rising from his chair, and was expelled without much difficulty. Apart from these attacks of lithiasis, he is perfectly well, teaching in the school, golfing, and making his water easily at normal intervals.

Here, then, we have a case of projecting middle lobe without any existing septic infection; an ideal one for suprapubic prostatectomy; the ultimate results of the operation performed two years and six months ago are all that could be desired, the urinary functions being performed normally, and the outlet for the bladder, instead of being obstructed, has permitted of the escape of calculi, one of which, at any rate, would have had difficulty in entering the normal prostatic urethra.

The following cases, in which a sexual operation was performed, were all examples of well-marked general prostatic enlargement, in which the disease had reached a critical stage, in virtue of the failure of catheter life and of the development of complications, rendering some curative operation necessary, in order to prolong if not preserve life. Four of these were subjected to double castration, of which the earliest was operated upon two years and eight months ago; the fifth case was a patient with only one testicle, the vas deferens of which I resected thirteen months ago. The particulars are briefly as follows:—

Case 1.—*Double castration.*—J. B., æt. 68, recommended to Professor Annandale's wards by Dr. Graham of Currie. Frequency of micturition, twelve months; one previous attack of retention; has to make water every half-hour during the day, and every two or three hours during the night, and the act is attended with burning pain; he can pass catheter but it pains him, and frequently causes bleeding. The urine is neutral, and contains pus and albumin. The residual urine amounts to 5 to 10 oz. The prostate, as felt per rectum, has a breadth equal to three fingers. The top of a long index finger can just reach its upper border.

Double castration, 6th August 1895.—Three weeks later, he was making water much more easily and at longer intervals, and the residual urine was reduced to 2 oz. He now enjoys a good night's rest, which he has not done for twelve months. Four months later he was so well that he sailed for Melbourne to visit his family. He was there visited, eight months later (twelve months after operation) by Dr. James Laing, a former house surgeon to Professor Annandale, who reported as follows: He had gained 21 lb. in weight, and was in the best of health. No enlargement of the prostate could be felt per rectum. He had not used a catheter for three months. He passes water every two and a half hours during the day, and as a rule four times during the night; the latter frequency he attributed to sleeplessness, as there is no real desire to micturate, but as he lies awake he has got into the habit of rising and emptying the bladder. Pus has disappeared from the urine; its specific gravity is 1018, and contains only a trace of albumin. Unfortunately, a catheter was not passed, so there is no information as to the persistence of residual urine.

Case 2.—*Double castration.*—J. S., æt. 67.—Seen with Dr. George W. Balfour and Dr. Helm. Frequent and difficult micturition, four years; catheter life, one year, and on the whole satisfactory, apart from occasional attacks of urethritis. A recent and acute attack of right-sided epididymitis and hydrocele. The urine contained a few pus cells; the prostate generally enlarged, bulging into the rectum, and soft in consistence.

Double castration, 8th August 1895.—The wounds healed at once, and he was up at the end of a week.

Four months later his general health was excellent, and he was able then and since to ride to hounds. He uses the catheter thrice in the twenty-four hours; it passes very easily and gives him no trouble. Between times he makes water easily and when he likes, but does not empty the bladder, for if he uses the catheter after passing all he can he draws off 4 to 8 oz. His chief complaint is of sudden attacks of flushing and sweating, which are partly relieved by atropine and by camphoric acid. Two years and three months after operation, he writes that he only uses the catheter once in the twenty-four hours, just before going to bed, and that it does not give him any trouble.

Case 3.—*Double castration.*—J. N., æt. 69, seen with Dr. Murdoch Brown, 22nd January 1896. Frequent, difficult, and painful micturition, two years; only passes a few ounces at a time; he has to rise thrice in the night; the urine is normal. There is great difficulty in passing a catheter because of straining; he cannot do it himself. A soft rubber catheter enters 11½ in. before the urine flows in a feeble stream. Per rectum the prostate is firm and very much enlarged. There is a recent hydrocele of the tunica vaginalis on both sides.

His life is rendered a burden by the dysuria, and catheter life is impossible.

Double castration, 2nd February 1896.—He was up at the end of a week. Since then he has maintained excellent health; has no pain nor any real annoyance connected with his bladder.

19th April 1898.—He only rises once in the night, and makes water quite easily, so that he gets a good night's rest. During the day he makes water every two or three hours, but thinks this is largely habit. Only uses the catheter (No. 8 gum elastic) when he has not had an opportunity of making water, and his bladder has become distended; it is passed quite easily; the urine is 1020 acid, and contains a few pus cells; there is only half an ounce of residual urine. The prostate is normal in size and in consistence.

Case 4.—*Double castration.*—J. W., æt. 76, seen with Dr. Murray Lyon, Midcalder. Frequency of micturition, ten years. Retention for thirty-six hours, four years ago; since then catheter life, with, however, increasing difficulty and pain, latterly amounting to agony, both at the neck of the bladder and at the point of the penis, during and after the emptying of the bladder. On two occasions there has been considerable hæmaturia. He described his life as being a burden to him, on account of his sufferings day and night. His prostate is about the largest I ever felt, and is very firm in consistence. A moderate degree of hydrocele is present on both sides, and some urethral discharge.

Double castration, 29th November 1897.—In a few days he was able to pass 2 to 3 oz. at a time without the catheter; the latter was required thrice a day to empty the bladder; it is passed quite easily. He expresses himself as having entered a new lease of life; the chief benefit has been the relief of pain.

16th April 1898.—Catheter required as before; is easily passed and gives no trouble.

Case 5.—*Unilateral vasectomy in patient with only one testicle.*—J. S., æt. 75; seen with Dr. Hunter of Linlithgow, 20th January 1897. Frequency of micturition, ten years; first attack of retention, eight years ago; acute epididymitis on left side, six years ago, resulting in complete atrophy of the testicle; the epididymitis was apparently the result of a catheter urethritis. The atrophy of the one testicle had no apparent influence on his ailment. He had acquired the habit of straining at micturition, and the latter act was frequently attended by involuntary evacuation of the bowels. He could no longer pass a catheter, and he lost the power, more and more, of emptying his bladder, and merely passed little dribbles frequently. A week before I saw him the retention became complete, and he was aspirated above the pubes; the large rectal prostatic catheter was then passed and tied in. This gave rise to painful spasms of the bladder and loss of sleep, and he began to go down hill rapidly.

When Dr. Hunter and I saw him together, his condition was very critical. The prostate was firm, generally enlarged, and corresponded to the breadth of three fingers from side to side. Under chloroform the only instrument I could pass was the largest size silver catheter, of the pattern introduced by Professor Chiene. As we knew that he could not bear to have this catheter tied in, we considered it necessary to open his bladder above the pubes and thus arrest the threatening septicæmia. The prostate was felt to project into the bladder as a firm, rounded mass, like a Tangerine orange. Within three days he was sitting up in a chair, greatly improved in every respect. Towards the end of the third week the fistula was closing rapidly, when the bladder again became distended; it was quite as difficult to pass a catheter as it had been before, and he was again passing into a critical state. I therefore reopened the suprapubic wound, and passed a tube into the bladder, and at the same time (6th March 1897) *resected one inch of the vas deferens* of his remaining (right) testicle. He was soon up and going about, with a tube from the suprapubic opening leading to a urinal inside the leg of his trousers. Three months after the vasectomy he was seen by Dr. Crawford Renton, in Glasgow, who passed a No. 9 soft catheter quite easily.

29th April 1898.—Suprapubic fistula still relied upon and kept open; occasionally a little by urethra. Prostate not appreciably altered. Some purulent discharge from the urethra.

Although the results in these four cases of double castration are neither very remarkable nor all that could be desired, still they are uniformly good. The operation is among the simplest in surgical practice; the patient need not be confined to bed for more than a few days. General anæsthesia is unnecessary. There were no evidences of any mental or bodily impairment which might be attributed to the loss of the testicles or to the abrogation of their functions. The urinary affection, which it was desired to benefit, has been robbed of its progressive and dangerous tendencies. Although the catheter is still required *as an adjunct* in three of them, it is no longer an absolute necessity; when required it is easily passed by the patient himself, without causing pain, hæmorrhage, orchitis, cystitis, etc. The contractile power of the bladder has improved, if it has not returned to the normal, and the residual urine has steadily diminished or disappeared. Their general health has greatly benefited, they have gained strength and weight, they enjoy their night's rest in a way to which they had long been strangers, and three of them have been able to resume their daily occupation. So far as their urinary organs are concerned, they give promise of enjoying continued good health. If it be borne in mind that every one of these patients had reached a critical stage of prostatic disease, which might be described as the beginning of the end, in which, under other circumstances, we should have given a bad prognosis, for it has been the experience that when catheter life fails the final cystic pyelo-nephritis or septicæmia is only a question of time, we may fairly infer that, had they been left without operation, they might not be alive and well at the present day.

My own experience of vasectomy is limited, but from the results published by others it would appear to be inferior to castration, because its results are not only less rapid but less certain. Castration is therefore the operation of choice in the

Operation.	Age.	Duration of Symptoms.	Previous Retention.	Catheter Life.	Residual Urine.	Date of Operation.	Date of Improvement.	Result.	
								Prostate.	Bladder.
Suprapubic prostatectomy	57	One year	Once	...	5-15 oz.	Oct. 20, 1895	Three months later	No change	Normal micturition (passed calculi since)
Double Castration	68	One year	Once	Three months' pain, bleeding	5–10 oz.	Aug. 6, 1895	Three weeks later	Scarcely to be felt	Normal micturition
	69	Four ,,	?	One year, urethritis, epididymitis	10 oz.	,, 8, 1895	Four months ,	?	Easy catheter, once in twenty-four hours
	69	Two ,,	Once	Impossible pain, orchitis	Bladder full and overflowing	Feb. 2, 1896	Three ,, ,,	Less than normal	Catheter only if distended, easy residual urine, ½ oz.
	76	Ten ,,	Several	Four years' bleeding, recent agony, double hydrocele	Do.	Nov. 29, 1897	One week ,,	No change	Easy, painless, catheter twice daily
Vasectomy and suprapubic drainage	75	Ten years	Several	Several years, latterly impossible	Bladder full and overflowing	Mar. 6, 1897	Continues to rely on suprapubic fistula. Can pass catheter.		

class of cases in which a sexual operation is indicated. It is to be rejected—(1) In cases where there are evidences of grave septic infection, for these can only be benefited by free drainage of the bladder; and (2) in cases where there exists an intravesical projection of the prostate, suitable for suprapubic prostatectomy.

A STUDY OF FOUR CASES OF FULL-TIME EXTRA-UTERINE PREGNANCY.[1]

By JAMES OLIVER, M.D., F.R.S.Ed., F.L.S., *Physician to the Hospital for Women, Soho, London.*

ECTOPIC pregnancy is now no longer a gynæcological rarity, but cases in which the fœtus attains maturity are, comparatively speaking, of so infrequent occurrence that a study of four cases occurring in the practice of one individual may be of some scientific value.

CASE 1.—*Gestation in the right broad ligament; copious flow per vaginam of fluid (amniotic) at the eighth month.*—Elizabeth G., æt. 33, and married six years, was confined with twins five years ago. Menstruation had occurred without pain since the confinement, although severe dysmenorrhœa had always been experienced before marriage.

In December 1896 the menstrual discharge failed to make its appearance; it reappeared, however, on 4th January 1897, and as it continued for four days and was of the usual amount it was considered a normal "period." During February, March, and April there was complete amenorrhœa. About the middle of May there was a copious discharge of blood per vaginam—"a flooding," as the patient described it; this continued for five hours. From May until the end of September there was again complete amenorrhœa. During October and November there flowed constantly a slight hæmorrhagic discharge from the vagina.

On 26th January 1897 patient was suddenly seized with severe pain in the lower abdomen, sickness, diarrhœa, and frequent desire to pass water. The bladder symptom subsided quickly, the sickness and diarrhœa proved somewhat troublesome for two or three days, and the abdominal pain, although never again very severe, was complained of more or less for nearly six months.

In the early part of July there flowed from the vagina for a week a watery discharge which emitted a peculiar odour, an odour like that of "the waters." It gushed suddenly from the vagina, and for two or three days it flowed so copiously that ten or twelve diapers were thoroughly saturated by it each day. It gradually diminished, and ceased entirely about the seventh day.

The patient came under my care on 22nd November 1897, and the following are the physical signs which were then noted. The lower abdomen is occupied by a somewhat ovoid tumour, the right half of which is larger and more prominent than the left. The tumour extends from the pubes to 2 in. above the umbilicus. At the level of the anterior superior spines of the ilia it extends 5 in. to the right and 4 in. to the left of the linea alba. The tumour is solid throughout, with the exception of a small area 2 in. by 2 in. at the upper border of the right half, where there is a sensation of fluid. The left half of the tumour is tender to the touch. At a spot midway between the pubes and umbilicus the girth is 38½ in. The cervix uteri is located high and towards the right wall of the pelvis; it is softish, and the os is slightly open. In front of the cervix the vaginal roof is pushed down a little by a portion of the abdominal tumour. The body of the uterus lies behind and is incorporated with the tumour.

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[1] In each case the fœtus had died before the patient came under my care.

The breasts are flabby, and colostrum is obtainable from both. No sounds are heard on auscultating the tumour. The temperature is normal.

Operation.—The abdominal wall was incised mesially from an inch above the pubes to an inch below the umbilicus. The peritoneal cavity was opened into by the upper half of this incision, but over the extent of the lower half the abdominal wall was incorporated with the tumour. The omentum and small bowel were extensively adherent to the upper half of the tumour. The fœtus, which was full-grown, was removed from the right broad ligament; the skin over its abdomen was slightly discoloured, in consequence of early decomposition. The fœtal sac contained no fluid, but the fœtus was thickly covered with inspissated sebaceous material. The placenta was lodged between the pubes and the uterus, and a small portion of it was implanted on the anterior wall of the latter. I cut the cord and decided to leave the placenta, as an attempt to remove it produced free hæmorrhage. The sac was stitched to the abdominal wall, and drained, and the patient recovered without an untoward symptom.

Conception probably took place soon after the menstrual period which ended on 13th November 1896. The sudden attack of abdominal pain, experienced on 26th January 1897, marks the time of rupture of the Fallopian tube and the escape of the fecundated ovum (about ten weeks old) into the substance of the right broad ligament. No external hæmorrhage was noted in association with this event. The watery fluid which flowed from the vagina during the early part of July was in my opinion amniotic fluid, and it escaped by a rupture at the seat of the Fallopian tube opening into the uterus, or by a distinct breach in the continuity of the uterine wall itself (at the time of operation the uterine wall was very thin close to the placental site). The fœtus must have died at the time of or soon after the escape of the amniotic fluid, and the slight discoloration of the fœtus observed at the time of the operation (four months only after the death of the fœtus) may be accounted for by the communication effected between the fœtal sac and the cavity of the uterus. No false labour pains were experienced. On two occasions during the life of the fœtus—in January and May—external hæmorrhage was noted. In May it must have been caused by the rupture of some vessel in the cavity of the uterus. No decidual shreds were expelled. In this case it is noteworthy that, since the confinement which took place five years before the present event, menstruation had occurred without pain, whereas severe dysmenorrhœa had always been experienced before marriage. Strahan says the history of an extra-uterine case is often, "one confinement, then an illness with pelvic trouble, then sterility for a long number of years, with menstrual pain and distress."

Case 2.—*Gestation in the right ovary. The mesovarium was ligatured and severed, and the tumour containing fœtus and placenta was removed intact.*—Cecilia H., æt. 39, and married twelve years, has had one child, and this child was born eleven years ago. In December 1894 the menstrual discharge, which previously had recurred regularly, failed to make its appearance, and it continued in abeyance until the 10th of March 1895, when what appears to have been a piece of decidual membrane was passed. The expulsion of this membrane—effected with but little pain—was accompanied by a very small quantity of blood-coloured discharge. In April, May, June, and July there was again complete amenorrhœa. On 26th August there was a copious discharge of blood, which persisted for about twelve hours only; fourteen days later there was during one day a slight discharge of blood again. In October and November there was complete amenorrhœa. On 25th December the menstrual discharge reappeared, and thereafter it recurred regularly until 14th May 1896, when abdominal section was performed.

In January and February 1895 she complained a good deal of abdominal pains, but since then she has experienced but little discomfort, and has been able to get about as usual, walking sometimes three or four miles a day.

The following are the physical signs noted on 18th April 1896, when the patient came under my care. The abdomen is prominent; it is occupied by a swelling which is located more in the right than the left half, and extends upwards from the pubes for 8½ in. The tumour is solid, and is slightly irregular at its right upper half. The abdominal girth at the umbilical level is 29¾ in. The cervix uteri is located somewhat towards the right wall of the pelvis; it is not soft, and the os is not open. The body of the uterus lies behind and is independent of the tumour. The breasts are flabby, but colostrum is obtainable from both. No sounds are heard on auscultating the tumour. The temperature is normal.

Operation.—The abdominal cavity was opened mesially. The omentum and portions of the small gut were found firmly adherent to the tumour, and were separated. It was then evident that the fœtus was lodged in the right ovary. The mesovarium was ligatured after the manner of dealing with an ordinary ovarian cyst; it was severed, and the sac containing fœtus and placenta was removed intact. No breach in the right Fallopian tube could be detected, either at the time of operation or afterwards. The left ovary appeared healthy.

After the operation had been completed, and the patient had been placed in bed, I opened the tumour and removed therefrom a full-grown fœtus in a perfect state of preservation. The placenta was located 2 or 3 in. from the seat of the severed mesovarium, and it was with great difficulty that it could be torn from the wall of the sac. The two were in fact structurally continuous. No fluid was found in the sac, but the fœtus was thickly covered with inspissated sebaceous material.

The patient made an excellent recovery, and was able to travel to the seaside from London on the twenty-fifth day after the operation.

In this case no external hæmorrhage occurred until the piece of decidual membrane was expelled from the uterus on 10th March, and she must then have been pregnant nearly four months. On two other occasions only during the life of the fœtus was external hæmorrhage noted, but on neither of these occasions did it last one day. These hæmorrhages were all due to the rupture of some vessel or vessels in the cavity of the uterus. In January and February—between the eighth and twelfth weeks of pregnancy—a good deal of abdominal pain was complained of, but after these months there was very little discomfort. No spurious labour pains were experienced. The fœtus probably died in September or October, and although it was not removed until 14th May it was in a state of perfect preservation. Menstruation was re-established on 25th December, about ten or fourteen weeks after the death of the fœtus. This patient never considered herself pregnant.

A few notes of this case appeared in the *Lancet* of 25th July 1896, in connection with an account of an experiment with the Röntgen rays:—

Case 3.—*Gestation in the right broad ligament.*—Hannah M., æt. 33, and married nine years, has had five children and one miscarry. The last child, born in July 1888, was suckled until October 1889, and it was then weaned on account of the reappearance of the menstrual discharge. From the time of weaning until June 1890 menstruation recurred regularly. In July 1890 the menstrual discharge failed to make its appearance, and from this month until April 1891 there was complete amenorrhœa. The menstrual discharge reappeared in April 1891; and until now, 1st October 1891 (the date on which the patient came under my care), it has recurred regularly and normally every month.

In July 1890 patient began to complain of sickness, and she suffered more or less from this symptom until the middle of March 1891. During this time the breasts were more firm and swollen. The sensation of quickening was felt in November, and thereafter she was sensible of the movements of the child until March 1891, but no movements have been felt since this month. The symptoms and sensations were in every respect similar to those which she had hitherto experienced when pregnant, and she has been able to discharge as usual her domestic duties. She engaged a doctor to attend her in her confinement, which she reckoned would take place in March. After March the breasts gradually became less full, and now they are practically in the condition they were a few months after the last child was weaned. The abdomen has never decreased in size. Occasionally she has complained of a little pain in the abdomen, but nothing like labour pains have ever been experienced.

The following are the physical signs which were noted on 1st October 1891 :—The abdomen is much distended; its girth at the level of the umbilicus is 39½ in. It is occupied centrally by a globular swelling which extends upwards from the pubes for 13 in. Fluctuation is elicited over the tumour, but it conveys the impression that the fluid is rather thick. Both flanks are resonant. The tumour extends further into the right than the left flank. The cervix uteri is located well forward and towards the right wall of the pelvis; it is soft, and the os admits—but not readily—the tip of the index finger. By bimanual examination there is detected, at a spot midway between the pubes and the anterior superior spine of the right ilium, what appears to be the body of the uterus incorporated with the abdominal tumour. No portion of the tumour is felt in the pelvis. The breasts are flaccid, and no colostrum can be obtained from them. No sounds are heard on auscultating the abdominal tumour. The temperature is 100° F. I may here remark that the evening temperature on the four days preceding operation varied from 102° F. to 103° F.

Operation.—The abdominal wall was incised mesially; and without opening the peritoneal cavity, the fœtus, which was full-grown and in a perfect state of preservation, was removed from its sac, which was located in the right broad ligament. The sac contained also a large quantity—about 6 pints—of creamy inodorous pus. The cavity was flushed with sterilised water and thoroughly sponged. The placenta was incorporated with the psoas and iliacus muscles, and bled so freely when I attempted to remove it that I thereupon decided to leave it and drain the cavity. The size of the opening by which the fœtus was delivered was then reduced by silkworm gut sutures. The patient made an excellent recovery.

In this case the gestation ran its full course without producing one symptom different to that of a normal pregnancy. No spurious labour pains were experienced. The fœtus evidently died in March, and a month or six weeks after this event the menstrual discharge was re-established and flowed regularly again every month. The presence of 6 pints of pus in the fœtal sac at the time of the operation accounts for the fact that no diminution in the size of the abdominal tumour took place after the death of the fœtus. It is somewhat remarkable that the fœtus was plump and well preserved, although it had been dead nearly seven months, and suppuration of the sac was well established.

Since abdominal section was performed, Hannah M. has been twice pregnant naturally; once she miscarried when four months pregnant, but in February 1895 she gave birth to a full-time child, and convalesced thereafter without an untoward symptom.

Case 4.—*Gestation in the left broad ligament.*—Alice M., æt. 37, and married fifteen years, has had five children. The last child was born ten years ago. Eleven months before coming under my care (which was in April 1891), patient was admitted into one of the large general hospitals of London, suffering from what was believed to be ovaritis; the patient herself was under the impression that she had miscarried five weeks before going into hospital. The history elicited concerning this illness, and which is that of the early days of her extra-uterine pregnancy, is as follows:—She entered the hospital during the first week of May 1890, complaining of a constant but slight hæmorrhagic discharge from the vagina, and which had been in existence for five weeks; during these weeks small clots had occasionally been passed. For three weeks before admission she had experienced slight pain in the left iliac region. Prior to the appearance of the hæmorrhagic discharge, patient "had gone" fourteen days over her usual menstrual cycle, *i.e.* there had been six weeks' amenorrhœa. Towards the end of May the hæmorrhagic discharge and pain in the left iliac region ceased, and she returned to her home.

In April 1891 patient came under my care complaining of enlargement of the abdomen. It had gradually increased in size since leaving the hospital in May of the previous year. From May 1890 until Christmas of that year there had been complete amenorrhœa. On 25th December menstruation was re-established, and it recurred normally thereafter until I performed abdominal section.

Throughout this illness patient had never complained of sickness.

Physical signs noted in April 1891.—The abdomen is occupied by a central globular and slightly cystic swelling, which extends from the pubes to 3 in. above the umbilicus, and which measures transversely 10 in. at the level of a spot located midway between the pubes and the umbilicus. The cervix uteri is directed towards the right wall of the pelvis; it is not soft, but the os is slightly open. To the right of the abdominal swelling, and apparently incorporated with it, is felt the body of the uterus; the latter is not enlarged. No portion of the abdominal swelling is felt in the pelvis. On auscultation no sounds are heard over the tumour. The breasts are flabby, and no colostrum is obtainable from them. The temperature is normal.

Operation.—The abdominal cavity was opened mesially, and after dealing with extensive adhesions of the omentum to the tumour, the latter was carefully opened, and a full-time, plump, and well-preserved fœtus was removed therefrom. The sac which was located in the left broad ligament contained, besides the fœtus, about 3 pints of a dirty and purulent-looking fluid. The cavity was thoroughly sponged, and a quantity of débris was thus removed. The placenta was left, as an attempt to remove it produced free hæmorrhage. The sac was stitched to the abdominal wall and drained, and the patient thereafter convalesced uninterruptedly.

In this case we are justified in assuming that conception took place soon after the menstrual period, which began on 14th February 1890. No external hæmorrhage occurred until the patient had gone fourteen days over her usual time for menstruating. Between the sixth and the eleventh or twelfth weeks of pregnancy there had flowed constantly a hæmorrhagic discharge from the vagina, and this discharge was probably derived from the mucous lining of the uterus. From the third until the tenth month there was complete amenorrhœa. Judging from the course of events after a normal parturition, and considering that the fœtus was full-grown, I am of opinion that the reappearance of the menstrual discharge on 24th December, and its regular recurrence thereafter, indicates that the fœtus had died a month or six weeks prior to that date. The tumour evidently had never decreased in size, and this is accounted for by the fact that the sac contained, besides a full-grown, plump, and well-preserved fœtus, 3 pints of fluid. In spite of the character of this fluid, the temperature was normal. The escape of the fœtus into the broad ligament by rupture of the Fallopian tube was so gradually effected that no symptom indicative of the occurrence of this event is to be noted. No pieces of decidual membrane appear to have been passed, and no spurious labour pains were at any time experienced.

NOTE ON THE CONDUCTION OF THE SECOND SOUNDS OF THE HEART.

By William Ewart, M.D., F.R.C.P., *Physician to and Joint Lecturer on Medicine at St. George's Hospital, Physician to the Belgrave Hospital for Children, London.*

I regret that any erroneous impression as to the area of conduction of the second aortic sound should have been conveyed by my work on "Cardiac Outlines," to which Dr. Habershon does me the honour to refer in his article on "The Diagnosis of the Position of the Interventricular Septum" in the June issue of this Journal. Its conduction is not limited; the marvel is rather that often it should be more loudly heard at the apex than at the site of its production.

A matter of greater importance is that raised by Dr. Habershon in connection with the pulmonary second sound. Since the publication of my "Outlines" I have devoted considerable care to a study of the conduction of the several sounds of the heart, and the results arrived at may be found in two papers published in the *Lancet.*[1] They have a direct bearing upon the subject of Dr. Habershon's paper, but they have escaped his notice. His conclusions, thus unbiassed by my work, confirm me in the impression that the peculiarity of the second pulmonary sound which I have described had not previously been generally recognised and perhaps never noticed.

Very great loudness of any sound will cause it to be heard beyond the usual boundaries. But so long as the loudness is not

[1] "A Clinical Lecture on the Heart Sounds and on Accuracy in Cardiac Auscultation," 27th March 1893; and "Note on the Auscultation of the Second Sounds of the Heart," 6th October 1894.

extreme, the pulmonary second sound is, I find, heard over a very limited area; of which the second left intercartilaginous space is the centre. In every direction outside this area the aortic sound is the sound which is heard. It follows that the second sound perceived over the right ventricle is not the pulmonary but the aortic sound.

So much importance in connection with the clinical study of the heart belongs in my opinion to this fact, that I doubt not Dr. Habershon will condone my calling renewed attention to a view which is open to further confirmation, although already based upon good evidence, but which his paper appears to have been, I believe, the first to question.

It is unnecessary to dwell again fully upon the reasons which I have given for this strange limitation, beyond stating once more that the conduction of the aortic sound takes place through the solid wall of the septum with which the aortic valves are in direct relation, whilst the aorta isolates the pulmonary artery from any direct contact with it. On the other hand, the contact between the pulmonary artery and the soft parts of the interspace causes the latter to act as a mute or damper upon the vibrations of the pulmonary sound. Attention may also be directed to the fact that the ventricles are practically empty of blood at the time of its production, and that any diffusion of this sound by conduction through blood must be limited to the small permanent infravalvular space of the conus arteriosus, which occupies, as is well known, a high level in the heart. The pulmonary second sound is thus intercepted by the chest wall in front, and by the aortic contents behind and below; and the solid conduction of the aortic sound takes place down the septum, almost uncomplicated by the admixture of any pulmonary element.

In spite of the plausibility of these and other reasons, which I have detailed elsewhere, the correctness of the observation itself may not be readily taken for granted by those lacking the opportunity of verifying it, without some strong positive evidence. This I have looked for and found since the date of my previous publications. Cases occur, and they are not very rare, in which, owing to extensive valvular disease, the aortic second sound is completely extinguished. The pulmonary second sound is then given its full opportunity; and the limitation of its conduction, if such as I have described, should become obvious. If this sound is not capable of ready transmission to the apex, no second sound whatever should be audible at the apex. This is precisely the condition which I have observed in these cases, which also afford a perfect demonstration of the remarkably restricted radiation of this sound.

ON DISSECTING ANEURYSM OF THE AORTA.

By T. N. Kelynack, M.D., M.R.C.P., *Pathologist, Manchester Royal Infirmary; Demonstrator and Assistant Lecturer in Pathology, Owens College, Manchester.*

(Plates I.–III.)

Cases of dissecting aneurysm are of sufficient rarity as doubtless to justify the record of the following striking example, which has recently come under my observation in the Pathological Department of the Manchester Royal Infirmary.

The patient was a married woman, æt. 50.

Clinical history.—She had suffered from "rheumatic" pains for years. About a year ago she strained herself while lifting a heavy bundle of clothes, and experienced a sudden pain in the chest. This compelled her to remain in bed for several weeks, but the pain in the chest persisted, although less severe. At this time also there were pains about the body, thought to be of a "rheumatic" nature. After some weeks she was able to get about again, but never recovered thoroughly, and suffered especially from palpitation and shortness of breath. She gradually got weaker, and stated that she used to sweat profusely and passed large quantities of pale-coloured urine. Latterly the symptoms became much worse, anasarca and ascites developing.

For some time she was under the care of Dr. Fenn, as an out-patient to the Hospital for Diseases of the Chest, then under Mr. Pritchard as a home-patient; and to these gentlemen, and to Dr. Bateman, house physician to the Royal Infirmary, I am indebted for details of the clinical history.

Three days before her death she was admitted to Dr. Dreschfeld's wards of the Manchester Royal Infirmary, through whose kindness I have been enabled to investigate the case. She was then extremely ill. There was great dyspnœa and extensive dropsy. The pulse was very feeble, irregular in force and rhythm, and numbered 160. There was a systolic murmur over the cardiac apex.

The following is a summary of my post-mortem report:—

Autopsy (External).—Body that of elderly female. General anasarca; extreme dropsy of lower extremities; prominent abdomen from ascitic distension; hæmorrhages about neck, shoulders, and arms; face cyanosed.

(Internal) *Thorax.*—Pericardium—enlarged; external adhesions to adjacent pleuræ; serous effusion; considerable subepicardial deposit of fat.

Heart.—Much enlarged; weight, 21 oz.; cavities and orifices dilated; tricuspid admits seven fingers, mitral four; mitral segments a little sclerosed, with a few warty vegetations; left ventricle greatly enlarged, cavity increased and walls hypertrophied; aortic valve slightly thickened; myocardium soft and flabby.

Aorta.—Distinctly atheromatous; 1 in. beyond left subclavian a small calcified patch; 4 in. below aperture of left subclavian artery and 1¼ in. below level of left bronchus is transverse slit, ⅝ by ⅛ in.; edges smooth, and not specially thickened; slit leads into fusiform sac formed in wall of aorta, 3½ in. in length and filled with laminated clot; the sac extends upwards above orifice for 1½ in., but downwards it narrows and extends in coats of thoracic and abdominal aorta to the bifurcation into the iliacs; 2¼ in. below slit, dissecting aneurysm, lying immediately behind main trunk of aorta, has diameter of 1¼ by ¾ in.; along the abdominal aorta are numerous apertures where the sac of the dissecting aneurysm communicates with the lumen of the aorta; several are no bigger than pin-points, but one, ¾ in. above bifurcation, is ½ in. in width; the separation of the aortic coats terminates on the right side by opening into the right common iliac 1 in. beyond bifurcation, and on left side by bursting into origin of left common iliac at level of bifurcation of aorta.

Several of the apertures appear to correspond to the orifices of the lumbar arteries; these vessels have been torn in the formation of the sac.

The sac can be seen to be formed by the separation of the layers of the middle coat of the aorta. It is lined more or less throughout by clot and fibrin, the coagulum at the upper part being particularly plentiful. Small vessels, the vasa vasorum, pass across side of sac.

Most of these points can be seen in the accompanying illustrations (Plates I. and II.).

Pleuræ.—Double hydrothorax.

Lungs.—Both small, congested, pigmented, and compressed. (Right), 24½ oz.; (left), 14½ oz., partially collapsed; upper part of aneurysm adherent to left lung, and bulging towards left pleura.

Abdomen—(Peritoneum).—Much ascites; flakes of lymph; band of omentum adherent to uterus. (Stomach and intestines).—Congested. (Liver).—Enlarged, 56½ oz.; pale, firm consistency; a little irregular on surface; in parts slightly "nutmeg." (Spleen).—Enlarged, 6½ oz.; firm, congested. (Kidneys).—Small (right), 4½ oz.; (left), 3 oz.; both somewhat cirrhotic. (Genitals).—Old adhesions about ovaries and tubes. The other organs present no features of particular interest.

Dissecting aneurysm does not appear to have been recognised before the present century.

The *history* of its identification is interesting. Laennec is usually credited with having first described it, but Peacock[1] has shown that, according to Broca, a M. Maunoir employed the same designation, and clearly described the formation of aneurysms of this kind in his work in 1802. In 1809, Burns[2] was the first to draw attention to the lesion in this country. In 1822, Shekelton[3] of Dublin recognised the condition, and several subsequent cases, especially in Ireland, have been spoken of as "Shekelton's aneurysm." In 1826, Laennec[1] carefully indicated the nature of the lesions, and recorded cases.

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[1] *Trans. Path. Soc. London*, 1862–63, vol. xiv. p. 87.

[2] "Observations on Diseases of the Heart, Aneurysm of the Thoracic Aorta, Preternatural Pulsation in the Epigastric Region, and Unusual Distribution of Arteries," Edin., 1809, p. 231.

[3] *Dublin Hosp. Rep.*, 1822, vol. iii. p. 231.

In 1837, Rokitansky published several cases. By 1843, Peacock was able to collect nineteen examples, and in 1849 he brought the number up to thirty-eight. From that time onwards a considerable number of cases have been recorded.

In this country we are particularly indebted to Peacock[2] for his valuable work in collecting the early cases. In 1863 he published a tabular synopsis of eighty cases, which indeed forms the basis of our knowledge of this curious lesion.

Since 1863 a comparatively small number of cases have been recorded, the most important in this country being those of—Ball,[3] Barker,[4] Bennett,[5] Box,[6] Coats,[7] Fagge,[8] Finny,[9] Gordon,[10] Haden,[11] Horsley,[12] Jollye,[13] Legg,[14] Leggat,[15] MacMullen,[16] Newman,[17] Oliver,[18] Rolleston,[19] Symes,[20] Turner,[21] West,[22] Whipham,[23] and Williams.[24]

A number of cases have also been met with on the Continent, and the lesion has formed the subject of several graduation dissertations.

As regards *frequency*, one may safely claim that the lesion is rare. Among nearly 1700 cases, which have been investigated in our pathological department during the period I have acted as pathologist, only this one example has been met with. Judged also by the cases in museums, the lesion is rare. It would probably be more frequently met with if cases of "sudden death" were more systematically submitted to thorough investigation. A very fine specimen was handed me by my friend, Dr. Brindley,

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[1] "Traité de l'auscultation mediate," 1826, tome ii. p. 692.

[2] *Edin. Med. Journ.*, 1843, vol. lx. p. 276; *London and Edin. Month. Journ. Med. Sc.*, 1843, vol. iii. p. 871; *ibid.*, 1848–49, vol. ix. p. 1052; *Trans. Path. Soc. London*, 1848–50, vol. ii. p. 42; *ibid.*, 1863, vol. xiv. p. 87; *ibid.*, 1866, vol. xvii. p. 50; *ibid.*, 1874, vol. xxv. p. 59.

[3] *Dublin Hosp. Gaz.*, 1857, vol. iv. p. 243.

[4] *Med.-Chir. Trans.*, London, 1860, N. S., vol. xxv. p. 131.

[5] *Ibid.*, 1849, vol. xxxii. p. 157.

[6] *St. Thomas' Hosp. Rep.*, London, 1894, N. S., vol. xxii. p. 180.

[7] "Manual of Pathology," London, 1895, p. 492.

[8] *Med.-Chir. Trans.*, London, 1869, vol. lii. p. 341.

[9] *Dublin Journ. Med. Sc.*, 1885, Ser. 3, vol. lxxx. pp. 159–276.

[10] *Proc. Path. Soc. Dublin*, 1864–65, N. S., vol. ii. p. 84.

[11] *Ibid.*, 1871–74, N. S., vol. v. p. 1.

[12] *Lancet*, London, 1875, vol. i. p. 758.

[13] *Ibid.*, 1889, vol. ii. p. 430.

[14] *Trans. Path. Soc. London*, 1869, vol. xx. p. 130; *ibid.*, 1878, vol. xxix. p. 65.

[15] *Ibid.*, 1866, vol. xvii. p. 52.

[16] *Dublin Journ. Med. Sc.*, 1885, Ser. 3, vol. xl. p. 424.

[17] *Glasgow Med. Journ.*, 1883, vol. xx. p. 456.

[18] *Lancet*, London, 1892, vol. i. p. 1068.

[19] *Trans. Path. Soc. London*, 1892–93, vol. xliv. p. 38.

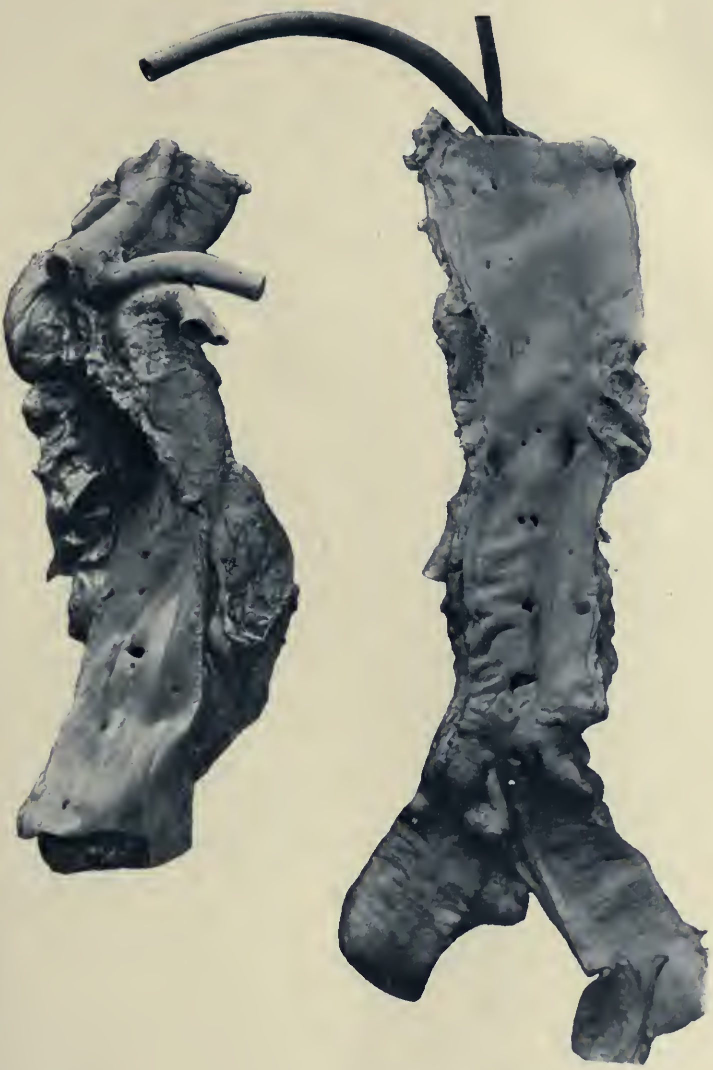
[20] *Dublin Journ. Med. Sc.*, 1864, vol. xxxvii. p. 466.

[21] *Trans. Path. Soc. London*, 1884–85, vol. xxxvi. p. 152.

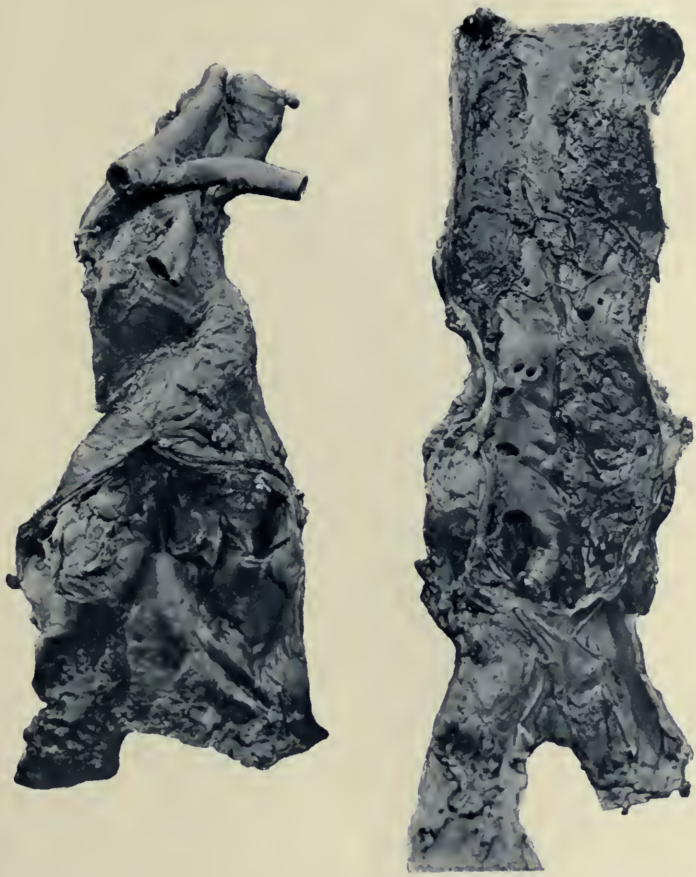
[22] *Ibid.*, 1882–83, vol. xxxiv. p. 65.

[23] *Ibid.*, 1871, vol. xxii. p. 113.

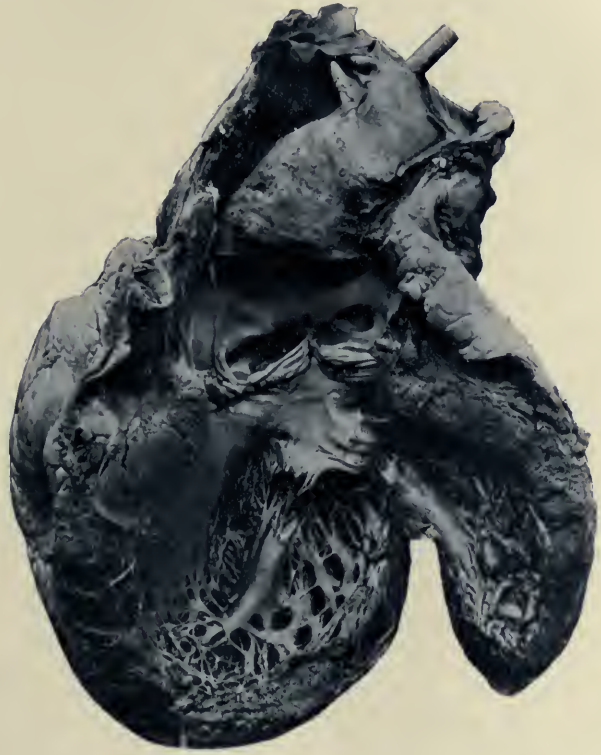
[24] *Ibid.*, 1864, vol. xv. p. 79.



Dissecting aneurysm. Portion of arch and descending thoracic aorta to the left; abdominal aorta and iliacs to right. Aorta laid open throughout. Bougies passed down sac of aneurysm in abdominal portion of aorta. Slit-like aperture in thoracic aorta with sac opposite bulging towards left pleura. Several apertures in abdominal aorta and terminal orifices in common iliacs. Atheromatous patches.



Dissecting aneurysm. Sac laid open and viewed from behind. Clot and layers of fibrin on walls. Holes indicating communications between sac and aorta. Stretched vasa vasorum.



Dissecting aneurysm of arch of aorta. From a man æt. 40. The sac of aneurysm formed by separation of middle coat is propped open by pin. A pencil is placed in lumen of aorta. For the photographs from which these illustrations have been prepared I am indebted to my brother, Mr. W. S. Kelynack.

who, when resident medical officer at the Infirmary, discovered a dissecting aneurysm, involving the arch of the aorta, in a case he was investigating outside the hospital for the coroner.

The subject was a labourer at a railway station and aged about 40. He was suddenly taken ill while at work, and died almost immediately.

At the autopsy the pericardium was found distended with blood. The character of the aneurysm is indicated in the accompanying illustration (Plate III.). The specimen has been added to the pathological collection of the Owens College. The same museum also contains other examples of dissecting aneurysm.

As regards *etiology*, our knowledge is somewhat imperfect. In many of the recorded cases the symptoms have, as in the above case, dated from a sudden strain.

With regard to *predisposing influences*, one may be a little more definite.

As to *sex*, the female seems certainly, as regards proportion, more liable than in the case of ordinary varieties of aneurysm.

The *age* was found by Peacock to vary from 17 to 95. Most cases, however, seem to occur in advanced middle life.

Occupation is of importance, in so far as it leads to vascular degenerative changes, or produces strain and sudden injury.

Disease of the vessel walls is of course the essential predisposing cause. Atheroma seems to be the most important lesion. Other forms of aortitis, including those of syphilitic origin, are also probably of etiological influence.

In some cases, however, there has been but little apparent disease of the aorta, and some have thought that in these instances the internal coats were abnormally fragile, and lacerated from influences not sufficient to produce tearing in an aorta of normal resilience.

A high arterial pressure may also be a factor of importance in some few cases.

As regards the *nature* of the lesion, the aneurysm consists of a separation of the coats of the vessel. This stripping apart of the coats usually occurs in the laminæ of the middle coat. It used to be said that the separation occurred between the middle and external coats, but this is probably never the case.

The *situation and form of the aperture* varies. The commonest seat for rupture is just above the aortic valve. It may, however, be met with in any part of the vessel. In some it has been near the origin of the innominate artery. In others it was a little beyond the left subclavian artery, as in my case. It is very rare in the abdominal aorta.

In form the aperture is generally slit-like. It may be transverse, oblique or vertical.

The *area of separation*—that is to say, the size of the aneurysm—varies. Usually it is from one-half to two-thirds of the circumference of the aorta. Occasionally the separation may extend to vessels arising from the aorta. This is especially the case with the large arteries originating from the arch.

The *extent* of the dissecting aneurysm varies greatly. Peacock has analysed his cases, and indicated his results in tabular form on this point. He only mentions two cases, where, as in my case, the internal rupture, situated at the commencement of the descending thoracic aorta and beyond the origin of the left subclavian artery, reached to the iliacs.

Three *varieties* may be recognised—(1) Where the separation forms a blind sac in the walls of the vessel; (2) where the sac has opened by one or more apertures into the lumen of the vessel; (3) where the aneurysm has burst through the external boundaries.

The *clinical features* are usually not distinctive. But few of the cases have been diagnosed. There are no special or peculiar signs or symptoms. Cardiac manifestations have been conspicuous in some instances, such as cardiac pain, angina, dyspnœa, anæmia, cyanosis, and the usual indications of cardiac failure. In not a few cases death has been "unexpected" and often "sudden."

Treatment must manifestly be purely symptomatic.

CLINICAL RECORDS.

A CASE OF HYSTERECTOMY FOR DECIDUOMA MALIGNUM.

By Mark Wardle, L.R.C.P. & S.Ed., *Bishop Auckland.*

This case is of particular interest, from the fact that it seems to supply a sort of connecting link between the somewhat vaguely understood deciduoma malignum and the clearly defined sarcoma. The history of the case is as follows:—

Mrs. B., æt. 42, a multipara, had been delivered of her last child in June 1896. It died at a month old. Menstruation was regular and natural until November, when she became pregnant. She aborted in February 1897, and until then had had no attack of hæmorrhage. She recovered from the miscarriage, and menstruated three or four times, the last time in July. The hæmorrhage from this continued in a mild form for about eight weeks, during which time she was treated with acid and ergot and other mixtures, with no apparent result. At the end of September she had a severe attack of hæmorrhage with many clots, and upon examination I found only some ulceration of the cervix. This was treated with nitrate of silver, followed by frequent douches of chinosol (1 to 1200), and was quite healed in about a week. From that time there were periodical attacks of hæmorrhage, more or less severe, until April the 12th, when she came to me again. I then found a mass of placenta-like substance protruding from the os, of very soft and friable character, which I removed as freely as was possible without an anæsthetic. I sent the specimen to the Clinical Research Association for examination, and received from Dr. Targett the following report:— " . . . The sections . . . are *not* exactly like those I have seen before, yet there is no question of the growth being malignant. It is a soft, hæmorrhagic, spindle-celled sarcoma. . . . There are many large polynuclear cells in it, and . . . it appears to be a very malignant growth."

On the strength of this I decided to remove the uterus, and operated on the 19th of April. On examining with a uterine sound on the 12th, I had formed the opinion that the growth was polypoid in shape, and that it sprang from the position of the left cornu. On examining before the operation, I found that although it had been practically all removed seven days before, it was again presenting through the os in a fungoid-looking mass. This was removed as high as possible, and the inner surface of the cervix carefully curetted to a good height. The belly was then opened in the middle line. Owing to the great thickness of fat tissue, and rather extensive adhesions, it was extremely difficult to get the uterus lifted out of the abdomen, and this could only be done after extending the incision to as near the pubes as possible. Finding the left ovary cystic, and the right presenting a soft unhealthy appearance, I removed them both along with the body of the uterus. This was done after clamping the cervix with a Hutchinson's clamp, and the stump was then fitted carefully into the lowest angle of the incision, which, for the rest of its extent, was accurately closed with gut sutures. The clamp was well packed and supported by gauze, and the usual dressings applied, after mopping the stump end with pure carbolic acid. In order to be sure that I had got well below the disease, I sent a portion of the lowest edge of the removed uterus for examination, and received the following report:—" This fragment consists of uterine tissue, partly covered with endometrium. There is a little inflammatory infiltration of the muscular substance, but no trace of malignant growth." I then sent the entire specimen to Dr. Targett, who very kindly examined it carefully, and wrote me as follows:—" It appears to be a somewhat polypoid growth from the posterior wall of the uterus, the surface of which is ragged from ulceration and necrosis. I tried to get another section of it, but the tissue is now partly decomposed, and will not stain. However, it is quite certain, from the microscopic sections already examined, that the growth is a spindle-celled sarcoma, with much infiltration of small inflammatory cells and blood clot. In a few places there are some large multi-nucleated cells, such as are not uncommon in sarcomata. From my experience of some five or six cases of deciduoma malignum, I should say that these sections are *not* quite typical of that disease. There is the same condition of necrosis, inflammation and hæmorrhage, but the large plasmoidal masses of deeply staining protoplasm with many nuclei are not to be seen here."

It would thus appear that this case takes a sort of borderline position between the deciduoma malignum and the undoubted sarcoma. The after-history has been uneventful. The temperature ranged between subnormal and 99°·4 F. She got up during the fifth week, and is now taking outdoor exercise.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

Reference Book of Practical Therapeutics. By various Authors. Edited by Frank P. Foster, M.D. In Two Volumes. London: Smith, Elder & Co. 1897.

These bulky volumes represent a vast amount of labour in the compilation of facts concerning the nature and action of remedial agents, labour which has been well spent, and is likely to be much appreciated. Arranged in dictionary form, and furnished with a most copious index, it constitutes an ideal book of reference,—such as might well be expected to have been produced under the supervision of the accomplished editor of the "Encyclopædic Medical Dictionary." The utility of such a work must in great measure depend upon the ground it covers, and on a subject like that of modern therapeutics it must be difficult to keep it within due limits. If anything, this book errs in attempting to include too much, for there can be little question that in respect to "new remedies" the medical profession has within the past decade or so been bewildered by the introduction of artificial drugs, most of which on trial fail to come up to the expectations formed of them. To make due mention of such fleeting favourites may render a reference book free from the reproach of incompleteness; yet, at the same time, it not only adds materially to its bulk, but assigns too great a prominence to matters that have little practical importance. Speaking generally, it may be said that the work before us may be divided into articles of two classes, namely, those in which the writer aims at giving mainly his personal experience of the remedy which he is describing, and those in which, by means of more or less lengthy quotations, the experiences of the enthusiastic advocate of some special drug constitute the main bulk of the article. The reader will naturally prefer to be guided by the former than the latter.

The contents of the volumes cannot be noticed in a detailed manner, they are so wide and exhaustive. Not a drug new or old, of tried value or equivocal utility, but may be found described in these pages with scientific fulness and accuracy. Each is dealt with in respect to its origin, its composition, physiological and toxic effects, and therapeutical applications. It would be impossible to do justice to these articles, each of which has been evidently written with care, and not seldom expanded by the addition of long excerpts from authorities on the subjects, *e.g.* that on "Amyl Nitrite" contains copious extracts from

Dr. Leech's "Croonian Lectures." The number of antipyretic drugs noticed tells of the extent to which this particular form of symptomatic treatment has been cultivated within comparatively recent times; but many, doubtless, will concur with the writer of the article "Acetanilide" (Dr. H. A. Griffin), in his protest against misuse of these agents. He believes that their lately lessening employment (and we think this is probably as true of this side of the Atlantic also) has been due to the cultivation of hydrotherapy, as well as to the recognition of the danger of antipyretic drugs, and of the harmlessness of moderate fever. He speaks highly of the analgesic properties of acetanilide, properties shared by many another substance of analogous origin. Dr. Westbrook writes fully upon "Alcohol," and his remarks on its employment in disease are especially practical and sensible. The subject of diet appears under at least three heads, namely, "Alimentation," "Food," and "Dietetic Treatment," the last-named including a survey of the numerous disorders, especially gastro-intestinal and nutritional, in which the regulation of diet is all-important. In the articles "Anæsthesia," "Chloroform," "Ether," "Nitrous Oxide," there will be found ample material for study upon the debatable question of the most appropriate form of anæsthetic to be given, and, as may be expected, ether is strongly preferred to chloroform. The writer of the article "Anæsthetics" says: "In most parts of the United States, ether has always held its place as the leading anæsthetic, and for the last few years there have been growing indications that European surgeons were coming to realise that supreme advantage of ether—safety. Absolute safety, it is true, there is not in the use of any anæsthetic; so profound a perturbation of the processes of life as the total abolition of all sensation cannot be brought about without some little risk. It is our plain duty, therefore, always to employ the anæsthetic that experience has shown to be the least dangerous, unless in an individual instance there is a special reason to choose some other." We have already referred to "Antipyretics," but it is worth noting that from "Antagonism" onwards, there are groups of remedies in vogue to which the prefix *anti-* has been applied—"Anti-asthmatics" and "Anti-spasmodics," "Anti-emetics" and "Antalgesics," "Anti-periodics" and "Anti blennorrhagics"—to name only a fraction. We cannot refrain from citing a passage from a somewhat sceptical, but not unreasonable article on "Anti-blennorrhagics," which, *mutatis mutandis*, might stand for many other groups. The writer says, after discussing the alleged value of such remedies: "Be this as it may, the fact stands, backed by clinical evidence leading up to biblical times, that a group of internal remedial agents, mainly essential oils, and almost without exception indigestible and nauseous, are held by the profession and the public alike to exert a specific curative influence over blennorrhagia. They come and go in popularity, these oils, with now and then a new fellow added to the family, heralded always by some enthusiastic advocate, usually to be condemned subsequently by others, less biassed, as utterly inefficient, or be by common consent dropped from further use." "Antiseptics" in their practical employment are treated under the heads of their use in "Surgery," in "Obstetrics," and for internal administration; whilst a very valuable and instructive article on "Germicides" is found in a later part of the volume. Amongst drugs may be specially cited the article "Coca and Cocaine," by Dr. J. Leonard Corning, who gives detailed instructions for subcutaneous administration of the latter, together with special directions whereby its local anæsthetic action may be prolonged for surgical purposes; that on "Creasote," including its intralaryngeal administration, and the articles on "Arsenic," "Opium," "Quinine," "Strychnine," to mention only a few. But the comprehensive character of the work is best shown by the fact that it contains articles on "Bloodletting," "Leeching," "Cupping," and "Scarification," as well as such modern subjects as "Animal Extracts and Juices," "Serum Treatment," and "Nucleins." The article on "Animal Extracts and Juices," by Dr. Eskridge, gives an admirable historical survey of the subject, and deals fairly with the extraordinary rise and development of a branch of therapeutics which, save in a few directions, has been a lamentable failure. Based on speculative hypothesis, the treatment of *local* diseases by means of extracts of the similar organs of a healthy animal rapidly declined to pure empiricism; and the haste with which many of such preparations have been introduced into medicine is a reproach upon our art and our science. Nevertheless, at least one notable exception stands forth as one of the most brilliant achievements of latter-day medicine—that of *thyroid medication*; and this subject is fittingly made the text of a separate article, for it stands on a different basis than most of the others. There are articles on "Antitoxins," and one of great fulness upon the "Serum Treatment," the author, Dr. Austin O'Malley, reviewing exhaustively the numerous septic and specific disorders in which up to the present this method has been tried. In none has such indubitable success been obtained as in diphtheria. To Dr. W. B. Coley is properly assigned the subject of the treatment of malignant tumours by "Toxines," and the reader will find in his article all that can be said in support of such heroic measures for desperate conditions. As regards "Nucleins," the interesting rôle of which has a future before it, the writer points out that the study of "nuclein-therapy" is still in an experimental stage, and cautiously concludes his article in these words: "There is danger of the eager and enthusiastic becoming too sanguine over the real and supposed results from the use of the nucleins; but if these agents possess one-half the virtues alleged for them, as stimulators of the various organs of the body, they will find a permanent and useful place in therapeutics, and in no class of cases will they be more welcome than in those of *general debility and neurasthenia.*" Lastly, attention may be drawn to the articles on "Climatic Treatment," on "Baths," on "Hydriatics," on "Electricity," on "Exercise," and on "Massage," as treating of subjects which in their later developments and applications are amongst the best assured gains of modern therapeutics. Dr. Charles Denison is the writer of the article on "Climatic Treatment," and although his studies are in the main confined to the North American health resorts, yet these are sufficiently representative to apply to all. In particular, the question of climatic treatment concerns the tuberculous, and it is clearly shown that the best results are to be obtained by the residence of such patients in a climate that is at once dry and cool, with a rarefied, clear, and pure atmosphere—conditions that are most likely to be obtained in high altitudes. Under "Hydriatics"—and also in the article on "Baths"—considerable attention is paid to the treatment of fever; and the notable results which have been obtained at the Johns Hopkins Hospital in the bath treatment of typhoid fever are cited. No cursory inspection of this work can, however, do justice to its merits. These are of a high order, for, as has been said, there is hardly a subject of therapeutical interest that does not receive notice. It is emphatically a work of reference, and is quite abreast of the knowledge of to-day; but, so rapid are the changes that are now in progress on all sides, there is no doubt that in a few years it will become necessary to revise its text very freely. It is safe to predict that such a revision will entail the excision of much that is now included, but it will be replaced by fresh contributions from fields at present perhaps but little cultivated, which may yield a full harvest of new and rational measures in support of the one great aim of medicine, the restoration to health of the disordered functions of the body. SIDNEY COUPLAND.

Treatise on the Diseases of Women. By ALEXANDER J. C. SKENE, M.D., LL.D. Third Edition. London: H. K. Lewis. 1898.

IN the preface to the first edition of this treatise the author states that his purpose is "to bring together the fully matured and essential facts of the science and art of gynæcology." In reading the book no one could fail to be impressed by the fact that Dr. Skene is writing from a large clinical experience. The various ailments are discussed in a way that shows that the author has carefully studied them in their practical aspects, and that his views are the result of years of careful clinical observation. Further evidence of this is given by the illustrative cases which are appended to each chapter. We are not sure, however, that this plan is altogether a good one; at least it is one which should be adopted with discretion. In many instances the illustrative cases are given at considerable length and with many details, so that they take up much more space than the account of the disease they are meant to illustrate.

The book is a large one, but it is written in a pleasant readable style, and the descriptions are not condensed to such an extent as to make them difficult to follow. Its whole tone is one of sober statement of fact and opinion. We believe that it is representative of American gynæcology at its best, and that is saying a good deal.

While there is an absence of any attempt to unduly push favourite hobbies, there are many passages in which the author gives original methods of treatment or original theories of the way in which some pathological conditions are produced. In his description of flexions of the uterus he seems to regard imperfect invagination of the cervix uteri in the vagina as one of the causes of anteflexion, and he gives an account of a plastic operation to relieve this condition. He is a thorough believer in the use of the clamp and cautery in the treatment of the pedicle in ovariotomy, and he also adopts a similar method in vaginal hysterectomy. His description of the pelvic floor is brief but clear, and in the account of injuries to which it is liable he emphasises the importance of the subcutaneous lacerations of muscles and fascia which sometimes occur during labour.

Dr. Skene is a firm believer in the importance of laceration of the cervix uteri as a cause of local and general ill health, and advocates Emmet's operation for its relief. He also draws attention to the serious conditions which may accompany cicatrices of the cervix and vagina, a subject which is often entirely omitted in gynæcological text-books. For prolapsus uteri he has given up the operation of colporrhaphy, and relies upon the combined use of the mechanical supports and operations on the cervix uteri and the pelvic floor. He makes the somewhat curious statement that the vagina will contract if pessaries are properly employed. In the chapter on retroversion of the uterus he notes the wide divergence of opinion as to the usefulness of pessaries for retroversion, and, while he himself believes that pessaries are of great value, he thinks that "if the harm done should be placed opposite the good accomplished by all the pessaries in use, the account would be about equally balanced."

The account of fibroid tumours of the uterus is rather short. The various methods of treatment, medical and surgical, are given, but there are no definite directions as to their suitability in individual cases. The statement that "since hysterectomy has been perfected, the removal of the ovaries for the cure of fibroids has been abandoned by the vast majority of surgeons," is open to question. In certain cases it is still the operation of choice amongst a large number of gynæcological surgeons, in this country at any rate. The extraperitoneal method of hysterectomy is mentioned as a matter of historical interest; Baer's and Kelly's intra-peritoneal methods are fully described; but nothing is said of the total extirpation of the fibroid uterus by the abdomen, or by the vagina, or by the combined method.

Nearly one-third of the book is devoted to diseases of the urinary organs. This section supplies such a complete and careful description of the diseases of the bladder and urethra in women, that the value of the treatise is greatly enhanced by its addition.

Archibald Donald.

Uric Acid as a Factor in the Causation of Disease. By Alexander Haig, M.A., M.D., F.R.C.P. Fourth Edition. London: J. & A. Churchill. 1897.

This, the fourth, edition is considerably larger than the third, and contains details of some further observations along with much additional argument. The great error into which authors like Dr. Haig are apt to fall is the acceptance of their own cases in the light of typical examples. Dr. Haig is practically a uric acid factory (perhaps he has partly reverted to the avian type), so much so that any little alteration in his surroundings, his diet, or his cerebral centres, causes an increase of his uric acid production, with, as he would say, a deficient excretion of the uric acid ingested, and consequently inconvenience. He does not agree, save in so far as nucleins may form a direct source of uric acid when taken by the mouth, with the theories whereby uric acid is regarded as being formed during the decomposition of nucleo-compounds in the body cells. We can, however, find no allusion to the work of Klemperer, Levison, Kolisch, Neusser, Salomé, and others, nor to Bohland's observation that salicylate of soda undoubtedly increases the amount of uric acid excreted, while at the same time it very largely increases the number of leucocytes in the blood. Dr. Haig especially draws attention to his freedom from the symptoms of "uric-acidæmia" (what a mongrel word!), ever since he has excluded meat and its included uric acid from his diet, forgetting at the same time that he has diminished the quantity of nucleins taken, while even now it appears that the small amount of uric acid or xanthin bases in his food supplies him with uric acid,—not enough, indeed, to cause unpleasant symptoms, but sufficient to permit of a slight addition of proteid food to his diet causing unpleasant symptoms. The author believes that all the uric acid and xanthins in the food pass into the blood, and are excreted unchanged. The addition, therefore, of the exceedingly small amount present in ½ lb. of mutton, which does not hurt the sheep, may be injurious to those constituted as he is. He found no uric acid or xanthin bases in eggs, but when he ate them he excreted an increased amount of uric acid. Perhaps this was so because yolk of egg contains a paranuclein, and some other unknown nitrogenous substances, from which the nuclei of the cells of the embryo arise. Milk and cheese, the only animal foods he allows himself, contain much nuclein and probably are able to keep up his uric acid supply, though not at a sufficiently high level to give rise to troublesome symptoms, except when other animal foods are added.

Alice in Wonderland found the Cheshire cat to be nearly all mouth—Dr. Haig's book is almost all I's. Twenty-seven pages taken at random yielded 167 first personal pronouns, or about 1½ per cent. of the total words. If this average persists throughout the volume, the printer has had to supply nearly 4000 capital I's. However accurate or praiseworthy the subject-matter of a book may be, the constant obtrusion of "I think," "I say," I deny," "I, etc.," renders its perusal in a proper state of mental equanimity impossible. The following is most artistic:—"But, as I have said, Horbaczewski's conclusions affect me but little"; or, perhaps better, "It really matters nothing to me whether uric acid is present. . . ." Dr. Haig and his theory are indivisible; the "me" in these sentences does not refer to his state of health, the theory is "me"! Records of observations, especially when they have been made on the author himself, appear more credible, and suggest less bias when they are described impersonally than with a constant assertion of the *ego*.

The amount of work done and trouble taken, represented by the contents of the volume, is immense, but the value of the results shown in it is rendered comparatively slight, owing to the author's tendency throughout to form definite conclusions, to forcibly fit everything into its proper place in the argument, to ignore theories promulgated by others, and supported by many eminent observers with as great appearance of conviction as he has in his, and to identify himself personally with his theory. No theory can be considered advantageously by its author, or discussed by him for the good of others, the premisses of which are "cribbed, cabined, and confined" in himself, begin and end in his brain alone, and are so jealously guarded that no light from without can shine upon them to reveal possible errors or probable fallacies. Let the author, having proved to his satisfaction his own personal source of uric acid, and put down in black and white the vagaries of the acid in his body, turn his attention towards antagonistic facts, and devote his energy to disproving the theories of others, not dismissing them with a contemptuous remark or two. We might even suggest the counting of his white blood corpuscles before and after salicylate of sodium, or in relation to his "uric-acidæmia" headaches, or an investigation into the minimum quantity of nuclein requisite to produce these headaches. A. Lockhart Gillespie.

Therapie der Hautkrankheiten. Von Dr. L. Leistikow, mit einem Vorwort von Dr. P. G. Unna. Hamburg und Leipzig: Leopold Voss. 1897.

There is always a fascination in tracing the methods in which others work, and when a man of genius sees fit to take into his confidence, and to show us his ways of procedure, we invariably listen to him with attention. Thus the "Memoirs of Robert Houdin," in which he tells us how he became a conjuror, and, to some extent, unveils the secrets of his tricks, are still attractive. At times a pupil can, even better than the master, convey to others the explanation of the *modus operandi*, on the principle, perhaps, that lookers-on see most of the game. This is the case with the work before us, as Leistikow has acted for many years as Unna's assistant, both in public and private, has watched his practice, has become thoroughly familiar with his modes of treatment, and these he has carefully reproduced. Unna, in a few well-chosen introductory remarks, points out that the principal difference between the modern and the older methods of treatment of skin diseases consists in this, that the modern individualises the remedy, nay more, the mode of applying the remedy, even to the minutest detail. It may not always be possible to indicate in every case of eczema when one should employ a diachylon or a white precipitate ointment, but we can show when it is advisable to prescribe a zinc glyco-gelatine or zinc salve-muslin in place of a chrysarobin or a pyrogallol ointment. From the improvement in technique, for which we have in great measure to thank Unna, the demand for new substances to employ has arisen, and no one can say that this has not, in recent years, been abundantly satisfied. It is claimed for the book that it is the first serious attempt to treat skin diseases, not from the mere empiric, but from the rational standpoint, by the selection of medicaments which will serve to counteract those perversions of nutrition revealed by the current methods of scientific research, and this idea will be found to be carefully kept in view throughout. In the plan followed, we are first introduced to the various combinations of remedies employed in cutaneous therapeutics at the present moment, to surgical-mechanical treatment, and then to the individual substances themselves, which are used in dermato-therapeutics, arranged alphabetically. The applications and the indications for the choice of each are tersely, but clearly, laid down, and observations are to be found here which one might seek for in vain in works exclusively devoted to materia medica and therapeutics. Indeed, in most of these latter, the external uses of drugs are very cursorily dealt with in comparison with the internal actions. In particular, much valuable information is provided on the effects of salicylic acid; of anthrarobin, which serves as a text for a résumé of Unna's views on reducing remedies; on chloride of calcium; on arnica, in which he has discovered new virtues; on pyrogallol, though the oxidised form, introduced by Unna himself, is dismissed in three lines; on resorcin, sulphur, and tumenol. After a sketch of constitutional treatment, the principal internal remedies have their uses laid down. The action of arsenic, mercury, iodine, ichthyol, and antimony is considered at some length. This disposes of one-third of the volume; the rest is taken up with an account of the management of cutaneous diseases, arranged according to the classification adopted in Unna's "Histopathology of the Skin." Leistikow does not confine himself in this to the usages of Unna; those of dermatologists in general are freely drawn on, wherever these are in consonance with his own. In this way the number of suggested methods is sometimes rather bewildering, though the reasons which ought to guide are, as a rule, pretty precisely stated. From an armamentarium such as is here furnished, there could be no difficulty in providing sufficient changes in treatment to satisfy the most fastidious patient, if not to ensure his cure. The book is one which will be found of the greatest value in all obstinate cases, and a reference to its pages will hardly be made without finding some suggestion of value. The practitioner who peruses it will meet with many an application which may be new to him; but the very full index will enable him to ascertain, in its proper place, what its nature is. Even to one moderately acquainted with German, little difficulty will be experienced in understanding it.

W. Allan Jamieson.

An Atlas of Histology for the Use of Students. By Arthur Clarkson, M.B., C.M. Bristol: John Wright & Co. 1898.

This atlas contains the coloured illustrations of the author's "Text-Book of Histology," and the reason given for this separate issue of the plates is that in such a form the book might be found to be especially useful for the student, studying either privately or in a class with others. The plates, on the whole, are beautifully clear, with a tendency, however, to diagrammatic portrayal. Some are described as diagrammatic or semi-diagrammatic, others, in fact the majority, are from drawings of high and low power views of actual specimens. In such a review as this, one can only glance shortly over some of the more important plates. Fig. 1 shows a diagrammatic representation of the stages of karyokinesis, which is by no means up to date. Most of the plates of the simple tissues are fairly good, only it would have been better to have shown the perforated membrane covering the mouths of the chalice cells and the mucigen in these cells with the clot of mucin at their openings.

Some of the plates are very stiff and artificial in character, *e.g.* those of cartilage, heart wall, suprarenals (especially that one showing the medulla), testis, epididymis, uterus, and ovary.

The silvered frog's nerve is also exceedingly artificial. It would have been better if Dr. Clarkson had represented exactly Professor Rutherford's views of the contraction of crab's muscle, as illustrated in his last paper.

The sections of arteries, trachea, and bronchi, and especially the sections of spinal cord, stained with aniline blue-black, are exceedingly good. Unfortunately, the drawings of lymphatic gland represent the old view of the nature of the adenoid reticulum, and not the one now generally accepted, of the cells being simply clasping ones on a fibrous reticulum. It is a pity that the author has made no use of the newer methods used in brain histology. This little book, however, is exceedingly clearly printed; and the plates for the most part are very instructive, and would undoubtedly be of some assistance to the student who does not possess the faculty of making good drawings from his own preparations.

A slight artificiality in all such plates cannot be avoided; and if the book is one of moderate price, a great deal must not be expected in the way of exact and artistic representation.

T. H. Milroy.

The Extra Pharmacopœia.—Revised in accordance with the *British Pharmacopœia*, 1898. By William Martindale, F.L.S., F.C.S., and W. Wynn Westcott, M.B. Ninth Edition. London, H. K. Lewis, 1898.

This useful work is so widely known to medical practitioners that a review in the ordinary sense becomes quite unnecessary, any notice of it being almost superfluous beyond the simple statement that the present edition has been issued as a result of the publication of the *British Pharmacopœia*, 1898. The additions and numerous other changes in the official volume have all been carefully noted in special lists, as well as incorporated in the general text, while the newer remedies of the last two or three years are also described more or less fully, and references given to the chief sources of literary information regarding them. Numerous slight additions and more recent information regarding certain remedial agents have been added here and there, but the *Extra Pharmacopœia* retains completely its original design and form, that of a supplement with short therapeutical notes, to the *British Pharmacopœia*.

Ralph Stockman.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,

MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

Clinical Tests, Methods, and Signs: The Urine—*continued.*

8. The Reaction; Acids.

Neumeister (*Ztschr. f. Biol.*, München) lays down that the urine is never neutral if the diet be rich in proteids, seldom if it be wholly vegetarian, but quite possibly with a mixed diet.

Oliviero (*Repert. de pharm.*, Paris, 1897, No. 7) titrates the urine with centi-normal soda solution and phenol-phthalein, computes the alkalinity of the blood from the acidity of the urine, and regards the method as capable of affording useful evidence in diagnosis and prognosis. (Phenol-phthalein does not indicate the true acidity of the urine, owing to the presence of ammonium salts.—A. L. G.). Berlioz, Lépinois, and Michel, referred to by Buckner (*München. med. Wchnschr.*, 14th June 1898), recommend the addition of a known quantity of a standard soda solution to a measured volume of urine, the excess of alkali un-neutralised being estimated by titration with deci-normal hydrochloric acid and the same indicator as above. From their observations, the average total acidity of the urine in the man (reckoned as HCl) is 1·4 per mille, and 1·83 grm. per diem; in the woman the total acidity reaches 1·2 per mille, and 1·54 grm. per diem.

In diabetes the corresponding figures are—in man, 1·33 and 2·52; in woman, 1·0 and 1·92. The total acidity and total acid excreted are likewise increased in gout and rheumatism.

Buckner notes, as Ritter has pointed out (*Ztschr. f. Biol.*, München, No. 2, 1897), that the estimation both of the total acidity and of that part of it due to the presence of acid phosphates is of more value to the physician than the determination of the amount of uric acid. Ritter finds that urine normally contains about 60 per cent. of its total phosphoric acid in the form of mono-, about 40 per cent. as di-sodium phosphate. When acid urate of sodium and acid phosphate of sodium come in contact, mono-phosphate of the metal is formed along with uric acid, the latter depositing in crystals, unless the acid phosphate is present in sufficiently great excess. Any increase of uric acid in the urine points to an excess of acid phosphate of sodium, with a higher total acidity,—the uric acid may be in crystals or in solution,—while the mono-phosphate acts in the opposite manner upon acid urate of sodium, in that it tends to precipitate it out of solution.

9. Urea.

Buckner (*ibid.*) suggests an easy method by which the proteid metabolism can be calculated with some degree of probability from comparatively simple operations. If it be granted that, as Buckner holds from many check experiments, when the salts in the urine are about normal in amount, especially the chlorides, the urea form one-half of the total solids, unless some abnormal constituent is present in excess, the specific gravity will give the approximate percentage of solids. A qualitative test for chlorides with nitrate of silver will show whether they are increased or not, or if present in small amount, and from this the total amount of salts may be reckoned in proportion.

As an example, a normal urine, 1000 c.c. in the twenty-four hours, had a specific gravity of 1028·5—

Total solids . . . . . (28·5 × 2·33) = 6·64 per cent.
Chlorides . . . . . precipitate normal.
No abnormal constituents.

The urea, therefore, was estimated at 3·32 grms. per cent.

Liebig's method showed 3·41 grms. per cent.; Kjeldahl's process, 1·81 grms. of nitrogen, or equal to 3·89 grms. of urea per cent., which will give a figure very similar to the others if the nitrogen of the uric acid and other nitrogenous constituents be subtracted.

In a case of diabetes passing 2250 c.c. urine per diem, with a specific gravity of 1038 and containing 4·8 per cent. of sugar, the total solids will be 199·1 grms. in the whole day's urine (38 × 2·33) × 2·25, the sugar, 108 grms. On subtracting the figure for the sugar from the total, 91·1 grms. remain, the half of which, 45·55 grms., corresponds to the amount of urea excreted. As 1 grm. of urea represents 2·9 grms. of albumin, or 13·7 grms. of flesh, the excess lost by the diabetic over the normal man amounts here to 170 grms. of flesh. The method appears to afford a means whereby a sufficiently accurate determination of proteid metabolism may be worked out from very simple everyday clinical manœuvres. Of course, allowance has to be made for the nature of the diet.

10. Pigments.

Loubian (*Chem. Ztg.*, Cöthen, 1897, No. 82) uses peroxide of hydrogen for the identification of Indican instead of hypochlorite of sodium; a solution of the perchloride of iron in hydrochloric acid also causes a colour reaction. Amann (*Rev. méd. de la Suisse Rom.*, Genève, 1897) oxidises it into indigo by means of a 10 per cent. solution of persulphate of sodium in water. After some chloroform has been added, if skatol also be present, the blue of the indigo passes into the chloroform, the violet colour from the skatol remains in the water above it.

Nakarai (*Deutsches Arch. f. klin. Med.*, Leipzig, No. 4, Bd. lviii., S. 318) has found hæmatoporphyrin in ten out of 144 urines examined for it. Hæmatoporphyrinuria is a constant symptom of lead-poisoning, and may occur after the administration of sulphonal or after intestinal hæmorrhages.

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11. High Specific Gravity.

Hoge (*Virginia Med. Month.*, Richmond, 27th May 1898, quoted in the *New York Med. Journ.*, 18th June 1898) is responsible for the following record:—A woman of 21, weight 120 lbs., with some irritation of the bladder after treatment for and cure of acute ovaritis, passed urine of a very dark colour, small in quantity and of acid reaction. Determination of the specific gravity was impossible in the undiluted specimen, the urinometer rising far above its limit. Dilution with water showed the extraordinary figure of 1·120 as its specific weight. Nothing abnormal was found on analysis, apart from a great excess of chlorides, 3·9 per cent. by weight, or in 700 c.c., the total of the urine passed during the twenty-four hours, the chlorides would reach 27·6 grms. No reason can be given for the occurrence, save that the patient drank little water, but ate much salt pork, ham, and mackerel.

The Heart.

1. Methods.

Bard (*Lyon méd.*, 1897, No. 5, tome lxxxiv.) is of opinion that the information to be gained by palpation of the heart with the flat hand is of more moment than auscultatory and other methods of examination. A few weeks' experience suffices to give the physician an accurate perception of the different varieties of the cardiac impulse, and especially can inform the examiner as to the state of the heart muscle as clearly, if not more clearly, than the performance of auscultation. Feilchenfeld also insists upon the greater advantages attending palpation over percussion and auscultation in cases of slight relaxation of the heart-walls, and the possibility of making a diagnosis early enough to prevent the occurrence of incurable dilatation.

Stengel (*Boston Med. and S. Journ.*, April 1897), in a well-illustrated paper of very considerable interest, extols the great superiority of auscultatory percussion over these methods performed separately. Stengel uses a binaural stethoscope, held in place by the patient or an assistant over the organ examined, while he percusses the skin lightly. In determining the size of an organ, he, as is usual, begins to percuss beyond the supposed margins of the organ, and marks the spots where the note first varies. He is of opinion that the objections advanced by many authorities to this procedure are really not of weight. (As the X-rays have shown the area of the heart mapped out by ordinary percussion to be almost absolutely correct, as published papers bear witness, such methods are surely superfluous. Cf. *Gaz. d. hôp.*, Paris, January 1897.—A. L. G.)

In the *New York Med. Journ.* for 4th December 1897, Sewall notes incidentally that the conduction of sound by the common binaural stethoscope is frequently imperfect, owing to ill-fitting ear-tips. He recommends separating the two head-pieces by cutting through just above the attachment of the spring, and reuniting them by a closely-fitting swivel joint. The main theme of his communication is the influence pressure exerted by a stethoscope has upon cardiac sounds. There is often among practitioners a deeply-seated conviction that the more firmly a stethoscope is pressed down upon the chest-wall, the more clearly will the sounds produced by the lungs and heart be heard. To begin with, the single stethoscope conducts sounds both through its solid portion and by the air in its central tube; the binaural conducts sound solely by air conduction, unless a coiled wire be inserted, when the addition of conduction by solid matter is also attempted to be afforded.

If a watch be enclosed in a cigar-box, light pressure on the box with the bell of a binaural stethoscope allows the ticking to be heard loudly all over; increasingly heavy pressure on the bell soon diminishes the conducted sound, and often annuls it altogether, except directly opposite to the watch. A wooden stethoscope is insensible to the effects of pressure upon the box. The binaural variety conducts all the complex tones of a note sounded on a stringed instrument, if lightly applied: pressure abolishing the over-tones, and rendering the note apparently lower in pitch. These over-tones and the pitch are apparently intensified by increase of pressure when the wooden stethoscope is similarly employed.

Jenner in 1856, and Walshe in 1862, have described most thoroughly the effects of pressure upon sound conduction through the rigid stethoscope. (How seldom these observations are made use of in the clinical instruction of students.) Sewall contributes valuable information as to the result of pressure in the flexible form of this instrument. For instance, the transmitted sound of closure of the aortic valve heard over the second right costal cartilage or interspace, is greatly reduced or obliterated by pressure, especially if auscultation be made over the interspace. Pressure here with the solid instrument, or with the phonendoscope, does not materially lessen the sound over the apex: pressure only alters the sound in quality and, slightly, in intensity, owing to the direct contact of the apex with the chest-wall, unless the patient have an emphysematous chest, or during deep expiration. The intrusion of lung tissue on these occasions may cause obliteration of the sounds, if pressure upon the bell of a flexible stethoscope be employed.

The heart sounds at the apex are due to direct vibration and to sympathetic resonance of the thorax. Should the fundamental tone of the chest-wall be a harmonic of the first sound of the heart, a feeble contraction may give rise to a powerful resonant note. Pressure applied upon the bell of the flexible stethoscope eliminates this resonance fallacy. By varying the pressure employed, a means of ascertaining the outline of the heart is available which is more certain than any other. Light pressure allows the sounds, or murmurs, to be heard over a wide area; firm pressure, by eliminating the complementary thoracic resonance, only renders the murmurs or the heart sounds audible practically over the ventricles themselves.

Pressure exerted, while using the flexible stethoscope, over the second costal interspace, annuls in part, or wholly, the second sound of the heart; but if the ascending aorta be dilated or the site of an aneurysm, the second sound persists strongly nowithstanding firm pressure.

Further, firm pressure removes—

(*A*) 1. Hæmic murmurs over the base of the heart (save Jenner's pulmonary murmurs).
2. An aortic obstructive murmur at the apex.
3. When mitral and aortic regurgitant murmurs co-exist, the aortic murmur is diminished in the greater degree.
4. Aortic regurgitant murmurs over the second right intercostal space.

While it does not markedly affect—

(*B*) 1. Mitral regurgitant murmurs heard over the apex; or
2. Mitral obstructive murmurs over the same spot.
3. Tricuspid regurgitant murmurs over the area of greatest intensity.
4. Aortic regurgitant murmurs over the apex (see (*A*), No. 3).

It should be borne in mind that, unlike the solid stethoscope, the flexible instrument only conducts to the ear vibrations of the air included in its tube, caused by movements of the tissue covered by its terminal end; that increase of pressure diminishes the power of vibration in this portion of tissue, thus excluding many of the sympathetic resonance tones; while the solid instrument conducts both air and actual tissue vibrations to the auditory receptive mechanism.

SURGERY.

UNDER THE CHARGE OF

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The Surgical Treatment of Local Manifestations of Filarial Disease.

Surgeon-Captain F. J. Crawford, attached to the Madras General Hospital, records his experiences (*Indian Med. Gaz.*, Calcutta, April 1898) in the operative treatment of the local lesions in filariasis. These include lymph-scrotum, filarial hydrocele, abscesses occurring in the course of lymphatic vessels, enlargements of lymphatic glands in the thigh and groin, and lymphangiectases. Though the system may still contain numbers of the parasites, there is no doubt regarding the success and the relief from suffering which result from removal of the local

[illegible]

lymph oozing ceas[illegible]
successful in the tr[illegible]
layer of the tunica v[illegible]

PRIMARY ACUT[illegible]

THERE is so little in[illegible]
with in the vertebr[illegible] com-
munication by Riese [illegible] Berlin.
The condition is di[illegible]
become drowsy, and [illegible]
local lesion, and th[illegible]
Hence the conditio[illegible]
pleurisy, peritonitis, [illegible]
ever, to make a diag[illegible]
inflammation origina[illegible]
processes. A chara[illegible] the
affected vertebræ on [illegible] pain
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during the first or [illegible]
possible stage, and [illegible]
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and only three made [illegible]
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healthy boy of seve[illegible]
heavy weight, he co[illegible] days
later he could not st[illegible]
There was œdemato[illegible]
tenderness on pres[illegible]
on compressing the [illegible] the
seventh day from the commencement of the illness. A teaspoonful of greenish yellow pus was obtained from beneath the periosteum of the laminæ of the fourth lumbar vertebra. These laminæ and the spinous process were removed with the bone-pliers. The dural sac was punctured, and was found to contain pus; it was therefore incised, and a teaspoonful of matter evacuated. The paralysis of the bladder soon disappeared. Small sequestra were afterwards removed from the laminæ of the third lumbar vertebra. The patient was allowed up four months later, and made an excellent recovery. The pus obtained at the operation yielded a pure culture of the staphylococcus pyogenes aureus. The infection is supposed to have originated in the whitlow.—*Centralbl. f. Chir.*, Leipzig, 4th June 1898, No. 22.

Operative Wounds of the Thoracic Duct.

Harvey W. Cushing of Baltimore draws attention to the very scanty information on this subject to be met with in our standard textbooks. It is fortunately rare that the thoracic duct, or one of its large branches, should be injured during operative procedures on the left side of the root of the neck. Under ordinary anatomical conditions, the duct does not rise above the level of the junction of the two great veins, and, till recently, routine dissections have not carried the operator to this region of the supra-clavicular triangle. At the Johns Hopkins, operations for carcinoma of the breast are almost invariably extended above the clavicle, where glandular enlargement, though not previously palpable, is found in a large number of cases; and during this dissection the angle between the veins is usually exposed. Among sixty cases so treated, thirty-five have been on the left side of the neck, and in only two has the duct, or one of its large branches, been injured. One of these was not recognised till the subsequent formation of a chylous sinus. There was never any similar injury in dissecting out tubercular glands. In the two cases referred to, one was remarkable from the fact that the wound in the duct was a visible one, and was successfully closed with a fine silk suture. Keen has the credit of recording the only previous case of successful suture of the duct. A summary is given of six other cases, in two of which the wound healed by first intention, but broke down on the tenth day, leading to a chylous fistula, which threatened starvation.

The duct, when occupying its normal anatomical position, is but little exposed to injury during operation. From the surgical standpoint, these anomalies of the cervical part of the duct are important, which carry it high into the neck.

In the treatment of wounds of the duct, suture is doubtless the ideal method, but must be confined to those fortunate cases in which the duct is fully exposed, and has not been completely divided. If suture is impossible, it is recommended to place a provisional ligature about the duct, on the proximal side of the wound, and to control the leakage, if possible, by plugging with gauze. Should, however, the leakage become uncontrollable and threaten starvation, the provisional ligature should be tied, with the hope of a final readjustment of collateral circulation, or trusting in the presence of some anastomotic branch which might suffice to carry the lymph into the venous circulation.

The abstractor had the opportunity some years ago of observing a case in which the main duct was wounded in the course of a dissection for the removal of a sarcoma from the supra-clavicular triangle. Milky chyle spurted from the wounded duct, and continued to leak, in spite of plugging of the wound, until the death of the patient six weeks later. Probably many similar disasters have occurred in surgical practice, and have not been published.—*Ann. Surg.*, Philadelphia, June 1898.

Gonorrhœa.

Neisser of Berlin (*Berl. klin. Wchnschr.*, 1898, No. 10) maintains that the demonstration of the gonococcus is the only reliable method of diagnosing gonorrhœa in prostitutes. Positive evidence on this point renders seclusion and hospital treatment compulsory. Were one to rely on clinical evidences alone, many cases of undoubted gonorrhœa would escape recognition. Should the gonococcus not be found at the first examination, it should be searched for on subsequent occasions.

Grosz and Collan (*Wien. klin. Wchnschr.*, 1898, No. 4) have each independently succeeded in obtaining a pure culture of gonococci in the fluid withdrawn by puncture from cases of gonorrhœal epididymitis. This observation has not been made before, although Neisser had already demonstrated the organism in question in gonorrhœal inflammation of the prostate and the seminal vesicles. In Grosz's case the fluid was obtained from an acute hydrocele accompanying the gonorrhœal epididymitis.

Colombini has recently examined the pus obtained from the glands in four cases of gonorrhœal bubo. A pure culture of gonococci was found in two of these; in a third, gonococci was found along with the staphylococcus pyogenes albus; in the fourth, the pus was sterile, and it was supposed that the gonococci had died out.

Bieck of Berlin (*Charité-Ann.*, Berlin, 1897) reports on 408 cases of gonorrhœa in the female which have been under treatment during the previous year. The vagina was affected in 106 recent cases, but only in 8·6 per cent. of the chronic cases. The cervix is then always involved, and especially the upper part of the vagina, showing that the latter is infected from the cervical canal. In the acute stage no injections are made, for fear of infecting the uterus itself. Plugs of ichthyolglycerin (10 per cent.) are employed to diminish the moisture in the vagina, and to hinder the development of the gonococci. In the subacute and chronic stages, antiseptic irrigations are employed, with the assistance of a speculum, and with proper care that the stream is not directed against the os uteri. Erosions on the cervix are treated with plugs of ichthyolglycerin and nosophen.

In recent cases the urethra is always infected, while in the chronic cases it is so in only 39·3 per cent. Gentle injections are made with argonin (1 to 2 per cent.) or ichthyol (1 to 3 per cent.), in the recent ones, while in those of longer standing the urethra is washed out with nitrate of silver, and later with argonin.

Warts were observed in 24·5 per cent. of the gonorrhœal cases. Apart from gonorrhœa, they were only present in six cases. Removal of the warts, after freezing with ethyl-chloride, has the advantage that the soft outgrowths freeze more rapidly than the harder folds of mucous membrane and caruncles, and are therefore easily distinguished from these. Suppuration in Bartholin's glands was observed in 13·2 per cent. of the cases, and with equal frequency whether the gonorrhœa was recent or of longer standing. In recent cases the abscess is freely opened and plugged. Healing takes place in about fourteen days. In chronic cases the entire gland should be dissected out, although this may be far from easy. The rectum was affected in 9·5 per cent., the anus in 7·3 per cent. of these, and the mucous membrane above the sphincters in 2·2 per cent. Only in the latter could one suspect coitus posterior, while in the former the infection resulted from the gonorrhœal discharge running down from the vagina. Eczema of the perinæum is very frequent, while rectal stricture, fistulæ, and periproctal abscesses are rare. Rectal gonorrhœa is treated by irrigation with chloride of zinc or argonin, and subsequently by suppositories of iodoform, nitrate of silver, or airol. Inflammation of the inguinal lymphatic glands, in the absence of chancre, is very rare, and was only observed in 4 per cent. out of 200 cases. Sometimes the inflammation was arrested by injections of 1 per cent. benzoate of mercury. As a rule, incision was necessary under local anæsthesia. Gonorrhœal rheumatism was observed in 3·9 per cent.; in two cases the neighbouring tendon sheaths were also involved. Sandal-wood oil was given internally; the joints were fixed and treated with hot sand baths. There were no cases of cystitis or other affection of the bladder.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Foreign Bodies in the Uterus.

Mittermaier (*Centralbl. f. Gynäk.*, Leipzig, Dec. 1897) reports two cases of the above. 1. A multipara, æt. 30, complained of a foul-smelling leucorrhœal discharge. A year previously she had had a submucous fibroid removed, when a silk suture was passed round the pedicle and the tumour cut off below it. On examination, the uterus was found to contain several fibroids, and there was also double pyosalpinx. Vaginal hysterectomy was performed, and at the orifice of the right tube a small submucous fibroid was found with a silk ligature round its pedicle, which had been drawn into the uterine cavity by the retraction of the remaining portion of the tumour, and had thus been the cause of the salpingitis.

In the second case, a glass catheter which had been used for irrigating the uterine cavity after curetting, had broken off and the fragments become imbedded in the uterine wall. After dilatation of the cervix, and ineffectual attempts to remove the fragments, the uterus was drawn into the vagina through an incision in the anterior vaginal wall, and the anterior uterine wall split from cervix to fundus, when five fragments of glass were found embedded in the mucous and muscular coats. These were removed and the wound sutured with catgut. Healing took place by first intention.

I. Repeated Cæsarean Section in a Case of Spondylolisthesis.

R. Braun v. Fernwald (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 19) reports a case where the under surface of the last lumbar vertebra covered the anterior part of the first and a great part of the second sacral vertebra. The obstetrical history :—

1. Pregnancy ended in turning and extraction of a dead fœtus.

2. Induced labour with forceps.
3. Ended at eighth month.
4. Abortion.
5. Cæsarean section.
6. Abortion induced at the third month.
7. Second Cæsarean section and extirpation of uterus.

At the second Cæsarean section the uterus was opened into by Fritsch's oblique incision, and afterwards removed, with retroperitoneal treatment of the stump. The anterior uterine wall was found very much thinned out, as compared with the cicatrix from the previous operation; and Braun-Fernwald mentions this as a possible cause of rupture of the uterus in cases where pregnancy occurs after a previous Cæsarean section. He refers to the best method of sterilising the patient after Cæsarean section. He objects to castration only, as the uterus without the ovaries is a worthless organ, and he would prefer removing both. Ligature of the tubes only is useless, as Falaschi and Fritsch have both reported cases of pregnancy following this method. Kehrer divides the tubes through a vaginal incision; but against this method is the possibility of subsequent union; and Fritsch's method of removing 1 cm. of tube tissue between the ligatured portions is no guarantee against the occurrence of a subsequent extra-uterine pregnancy. Braun-Fernwald divides the uterine ends of the tubes between two ligatures, and turns in the uterine stump on both sides under the peritoneum, and sutures the latter over the ends.

Rühl adopts a similar method through the anterior vaginal wall, and sutures the ends of the tubes to the vaginal mucous membrane.

II. Repeated Ventro-fixation of the Uterus for Prolapse, followed by Kinking of Intestine.

Lindfors reports (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 16) the case of a woman who at the age of 15 suffered from uterine prolapse, the result of excessive outdoor work. Married at 28, and remained sterile for two years—probably as the result of the prolapse and retroflexion!

Ventro-fixation after Leopold's method—the point of fixation on the anterior uterine wall, corresponding to a point 1½ cm. below the fundus. Four months later, patient was delivered of twins, forceps being used; and in six months the prolapse recurred. This was again in six months treated by ventro-fixation. Eight days later there were symptoms of intestinal obstruction, and on reopening the abdomen a loop of bowel was found, passing from the right side between the uterus and anterior abdominal wall. The loop of intestine was withdrawn and the uterus again fixed, the sutures being inserted into the uterine substance lower than on the former occasions. Lindfors refers to two other cases of intestinal obstruction following on ventro-fixation, reported by Jakobs and Olshausen, and he points out the importance of inserting the uterine sutures at a point which will not permit of the passage of a loop of intestine between the uterus and anterior abdominal wall.

The Clinical Significance of Pleuritic Effusions in Cases of Ovarian Tumours.

Giuseppe Resinelli (*Med. News*, New York, 29th Jan. 1898) writes on this subject. He concludes that pleuritic effusions frequently occur in cases of ovarian tumour, not as an accidental complication, but as a consequence of the condition. The effusion develops insidiously without pain or temperature, is most frequently bilateral, and, if unilateral, the right side is more commonly affected. He says it is not due to circulatory disturbance, nor to any alteration in the character of the blood, but to a propagation of the disease to the pleura, or more frequently to pleuritic reaction from irritation transmitted through the diaphragm. Sometimes it is due to an abnormal peritoneal irritation, especially in cases where ascites is present. When a pleuritic effusion not due to acute pleurisy appears in cases of ovarian tumour, it is a sign of the malignancy of the case, especially if we can exclude torsion of the pedicle, suppuration, and rupture of cysts. When the effusion is not due to extension of the disease to the pleura or lungs, operative interference is indicated, but operative interference must be determined by the situation and extension of possible peritoneal foci, as it is in these cases that pleuritic effusion most commonly occurs. Paracentesis thoracis may, in rare cases, be preparatory to laparotomy, but complete removal of the tumour is the surest way of removing the effusion.

Deciduoma Malignum.

Laennberg (*Nord. Med. Ark.*, Stockholm) has investigated all the recorded cases of deciduoma malignum, which are fifty-three in number. In twenty-four of these the condition appeared immediately after molar pregnancy. Three new cases are reported. One, who was 42 years of age, was delivered of a hydatid mole, followed by bleeding; four weeks later the uterus was removed, there being secondary growths in the vagina, which were also removed subsequently. The microscope showed the growth to contain two cell elements:—(1) Synctium, formed by flattened giant cells, containing numerous vacuoles; (2) large polygonal cells with well-defined contour. The tumour extended in the form of papillæ into the healthy tissues, but did not affect the structure of the uterine walls. The author believes that the serotinal epithelial cells had undergone malignant degeneration, and that both they and the polygonal cells are of maternal origin.

Two other cases are reported by Karström and Vestberg (*Hygiea*, Stockholm, Bd. lviii.)—(1) Patient, æt. 32, was the subject of a hydatid mole; four weeks later there was bleeding, and a swelling was found at the right side of the uterus; shortly afterwards, another swelling was found on the left side, which grew rapidly. The uterus, along with two ovarian tumours, was removed, when a tumour, part of which was necrosed, was found arising from the posterior uterine wall. This tumour consisted of a protoplasmic framework with nuclei, but no well-defined cell bodies. The framework interlaced, and at the points of crossing were small spaces with no intercellular substance nor fundamental tissue, and with neither lymphatics nor blood vessels. The framework contained numerous vacuoles, with blood corpuscles, well-defined cells, and cell fragments in their interior. The transition of living into dead tissue was a gradual one. The nuclei were large, oval, and rich in chromatin; and where the living portions enclosed the necrosed ones, it resembled chorion with a covering of synctium. In the second case the uterus was removed six months after abortion. On examination of the tumour, the structure resembled that of the previous case, but was more complicated. The synctium was intermingled with a cell mass, which formed the greater part of the tumour, and divided it into alveoli and smaller irregular masses. The new growth invaded the healthy tissues in finger-like processes composed of synctium. The authors considered that their first case was of the synctial type; the second of the mixed type, but without decidual cells. The interlacing of the synctial tissues enclosing the detached cells prevent them being swept into the lymph channels, and thus lessens the chance of secondary deposits. Owing to the deficient blood supply, they are apt to undergo necrotic changes. The authors state that these cases can be classed neither as carcinomatæ nor sarcomata, and that no scientific classification is at present possible.

A short account of other two cases is given in the Brief of Current Literature of the *Am. Journ. Obs.*, N.Y., for May of the present year.

In the first case the patient was curetted after abortion, as the bleeding returned, and her general health became affected; the uterus was removed three weeks later. In the fundus uteri was found a tumour, which on microscopic examination showed chorionic villi, the epithelium of which had proliferated and invaded the surrounding tissues.

The second case, a woman æt. 22, aborted at the fourth month; three months later she was curetted, but only healthy mucous membrane removed. Later, bleeding returned, and a new growth was discovered in the anterior vaginal wall. No operation could be performed, as the lungs were by this time affected, but, post mortem, the uterus was much enlarged and infiltrated with hæmorrhagic structures, and the vagina, labia, bladder, ovaries, with the neighbouring lymph channels, as also the lungs, showed metastatic growths. On microscopic examination, there was no coherent synctial framework, the tumour consisting of a mass of isolated cells extending into the surrounding structures, and the infiltration closely resembled the serotina of hydatid moles.

RUPTURE OF LAPAROTOMY WOUND.

BRAUN (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 3) reports the rupture of the laparotomy wound ten days after operation, and remarks that he recently published another case in which the accident occurred six days after operation, and where secondary closure of the wound effected a complete cure. In the present case the subject was exceedingly fat. The abdominal incision, 10 cms. in length, healed by first intention, and the sutures were removed on the ninth day. The patient stated that about twenty-four hours later, after a violent fit of coughing, she experienced a sudden pain in the abdomen; when the dressing was changed twelve hours later, the abdominal wound was found to be entirely open, and a coil of intestine protruded. The wound was closed again with wire and silk sutures, which effected a permanent cure.

THERAPEUTICS.

UNDER THE CHARGE OF

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Action of Carbonate and Salicylate of Sodium on Gout, Rheumatism, and Uric Acid Excretion.

Mordhorst has contributed the results of a research, partly chemical and partly clinical, on this subject (*Centralbl. f. innere Med.*, Leipzig, 30th April 1898). He begins by stating that under the term "rheumatism" he includes the widely known painful affections of muscles, tendons, fascia, and joints generally known by that name, but which he himself regards as an early stage of gout. He holds that the symptoms are due to small deposits of urates in the tissues. The beneficial, although often very transitory, improvement under sodium salicylate he attributes to its solvent action on the urates. He found that (1) sodium salts (chloride, phosphate, bicarbonate, etc.), when added to a solution of sodium hydrate saturated with uric acid, cause a precipitate of urate of sodium in small globules; (2) these remain unchanged for weeks and months, but gradually form also needle and star-shaped crystals of sodium biurate; (3) salicylate of sodium in small amount hinders this, and also is capable of dissolving up the already formed crystals. Mordhorst believes that a similar action takes place in the tissues, where urates have been thrown down from the lymph; (4) acids tend to precipitate the urates in the body, while salicylate, carbonate, and bicarbonate of sodium hinder the precipitation; (5) sodium salicylate hastens the transformation of urates in globular form into needles, these tend to remain in the joints and give rise to true gout, and hence the chronicity and frequent relapses; (6) the globular urates are capable of oxidation, the needle-shaped crystals are not; (7) sodium carbonate and bicarbonate do not directly hasten the solution of urates, but indirectly they do so, because, by becoming combined with uric acid, they lessen its amount in the fluids, and hence the urates already formed are more easily dissolved.

Effects of Mercury on the Blood in Syphilis.

Lindstroem has studied the effects of mercury on the blood in cases of syphilis, taking exact observations on the number of red and white corpuscles, and on the amount of hæmoglobin (*Presse méd.*, Paris, 18th May 1898). He gave the perchloride and benzoate of mercury by intravenous injection, so that there could be no doubt of its absorption into the blood. Earlier observations, while not quite in agreement, seem to point to the conclusion that mercury at first causes a very decided improvement in the blood condition, but that when it is pushed a deterioration takes place. About $\frac{1}{60}$ to $\frac{1}{9}$ gr. was given at each dose. Within one or two days the increase in the red corpuscles and hæmoglobin was marked and immediate, while the white corpuscles diminished in number. These effects seem to depend directly on an action on the blood-forming organs, and take place without any reference to improvement of the syphilitic condition. If the mercury is omitted, the blood gradually returns to its former condition. As the dose is increased, and only then, an improvement takes place in the syphilitic lesions. The changes in the blood for the better never extend beyond a certain limit—namely, its approximate physiological average. After about 3 grs. of sublimate have been given, slight mercurial intoxication is apt to ensue, and this is always accompanied by a deterioration in the blood condition—the red corpuscles and hæmoglobin diminish, while there is an increase in the number of leucocytes. If the mercury be still pushed, marked anæmia is apt to result, and this tends to continue for a considerable time after treatment has been stopped. If the syphilis be severe, improvement of the blood keeps pace with the improvement in the syphilitic manifestations.

Glutoid Capsules.

This name has been given to capsules of gelatin hardened by steeping in formaldehyde (formalin), and which have the property of being insoluble in water and the gastric digestive juices, while they dissolve with comparative readiness during pancreatic digestion. They are therefore adapted for the administration of substances which it is desired should pass through the stomach unchanged, and exert their action on the intestinal tract solely. Sahli (*Cor.-Bl. f. schweiz. Aerzte*, Basel, 15th May 1898) states that, after numerous trials with pills and capsules coated with keratin, wax, resins, etc., he has come to the conclusion that these are all unreliable, and that the glutoid coating is much superior as a protective against the action of the gastric juice. It can be made of very different degrees of resistance, up to the point that it is no longer digested by the pancreatic juice, and passes therefore through the intestine unchanged. Great care is therefore necessary in their manufacture, so as to obtain the proper degree of hardness and resistance. Healthy persons do not digest either the pills or capsules in the stomach, this having been ascertained by washing out that organ at varying intervals after they had been swallowed, and finding that they were still intact.

Influence of Alcohol on Digestive Secretions.

Chittenden, Mendel, and Jackson have published a long investigation into this subject (*Am. Journ. Physiol.*, March 1898). The secretion of saliva is affected by dilute alcohol and alcoholic drinks much as it is by other gentle irritants in the mouth, that is, there is a transient stimulation of the secretion, but not in any way specific as regards the alcohol. Upon gastric secretion all alcoholic fluids have a marked effect in increasing the amount, the acidity, and the total solids, the digestive power being also increased. They found that in dogs, at least, no retardation of gastric digestion took place with moderate amounts of alcohol; but hastening also could not be determined. Speaking broadly, therefore, gastric digestion in dogs is not much influenced by alcohol. Alcohol is rapidly absorbed from the stomach, a moderate quantity always disappearing under half an hour, and probably very little of it ever passes into the intestine.

INSANITY.

UNDER THE CHARGE OF

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Automatism as a Manifestation of Syphilis.

Professor Bechterew (*Rev. neurol.*, Paris, Jan. 1897), in discussing the subject of automatism, states that up till now those conditions classed under the designation of automatism have been chiefly noted in epilepsy and chronic alcoholism. The automatism observed in chronic alcoholism is considered by several authors as a manifestation of the epileptic neurosis, acquired under the influence of alcohol; others hold the opinion that it may be developed in certain cases in the course of chronic alcoholism, but independently of the influence of the epilepsy.

The observation quoted by the author establishes the fact that automatism presenting the same characteristics as are observed in epilepsy and chronic alcoholism, may be manifested as a quite independent phenomenon in cerebral syphilis.

The author cites the case of a man, æt. 37, without any hereditary psychical or neuropathic history. He was sent from his office to the bank to negotiate a bill of exchange, and on returning from his commission began to tear in pieces the bank notes he had received. This singular action quickly attracted the attention of his fellow-clerks, who took the money from him and placed him sitting on a chair. Shortly afterwards he regained consciousness, and had no recollection of having been to the bank or of having received money. He did not even remember what had occurred to him after his return to his office.

A short time after, he had two similar attacks. After examining and considering the case, the author concludes that his state arose out of cerebral syphilis. Not only does the absence of other etiological elements point to this, but especially the loss of memory and the presence of characteristic headaches, a bony tumour on the foot, as well as tumefactions on the forehead which were sore to the touch.

The question may be put thus: Can one place all the cases of syphilitic automatism in the category of epileptic automatism determined by syphilis, or must one consider these cases as morbid conditions developed independently in a subject already suffering from cerebral syphilis? Bechterew considers the latter opinion as having the clearer justification in the facts given.

HAS THE CELLULAR NUCLEUS INDEPENDENT EXISTENCE?

THE *Boston Med. and S. Journ.* notes the interesting presentation and discussion of this subject at the Moscow Congress as follows:—A very interesting paper was contributed to the Moscow Congress by Professor Loukianoff, Director of the Institute of Experimental Medicine in St. Petersburg, on "Inanition of the Cellular Nucleus." Notwithstanding the great advances made recently in the science of cellular morphology, he called attention to the fact that there still remain important problems awaiting solution, such, for instance, as the conditions of life surrounding the cellular nucleus.

The nucleus is undoubtedly the most important element of the cell, but we know very little as to its functions of nutrition and growth. To investigate certain vital functions of the nucleus, he had made experiments touching upon the changes produced in the nucleus when the organism is placed in a condition of inanition. The results of these experiments tend to prove beyond a doubt that the nucleus is endowed with an independent existence.

Dr. Loudon had investigated the influence of starvation of bacteria (an analogous problem). He found that bacteria subjected to starvation diminish rapidly to 50 per cent. of their former mass. After this period of diminution, a condition of equilibrium is established, when the bacteria show no changes. In this they differ from the multicellular organism. Along with these experiments, others were conducted on the cellular nucleus itself. Whilst investigating the changes produced in the pancreas of the guinea-pigs subjected to starvation, Brunner observed that while the cell loses 10 per cent. of its substance, the loss of the nucleus amounts only to 3 per cent. We are therefore justified in thinking that the nucleus suffers less from lack of nutrition than the cellular substance, and although a part of the cell, it does not lose its autonomy. The cell again consists of various elements, the most important of which is the nucleolus.

Madame Dovranovitch, experimenting on changes produced in a starving organism, found that while the cellular tissue lost 40 per cent. of its mass, the nucleus lost $25\frac{4}{10}$ per cent., and the nucleolus $43\frac{5}{10}$ per cent.

Dr. Laraveitch, experimenting in Loukianoff's laboratory on guinea-pigs, found that while the body in general loses 35 per cent., the loss of the nucleus of the hepatic cell is only 25 per cent. of its mass. All these experiments go to prove the fact that, while the cell, the nucleus, and the nucleolus lead an existence in common, it is nevertheless variable in each.

Loukianoff described his own experiments concerning the change produced in the cell and its nucleus by various forms of starvation.

Twenty animals (white mice, as they seem the least influenced by change in food) were subdivided into six groups; some were deprived of both food and drink, three were fed on tallow, three on egg-albumin, three on peptones, and three on oats; thus some animals were subjected to absolute starvation, some fed exclusively on fat, others on nitrogenous food, and others on albumin. The experimentation investigated the changes in the longitudinal and transverse diameters of the hepatic cell. The number of these measurements (about 2000) are sufficient to draw more or less definite conclusions from. The cellular nucleus diminishes from fasting, but this diminution is not related directly to the changes which take place in the organism.

While suffering as much as the organism from complete starvation, the nucleus presents changes different from those found in the organism in cases of partial starvation, as expressed in the predominance of nitrogenous, albuminous, or fatty food. The biological anatomy of the nucleus is also evidenced from another fact; the one or the other kind of inanition influences the formation of double nuclei; but this division of the nucleus into two parts does not run parallel with the changes of nutrition, as experienced by the nucleus, nor does it have anything in common with the alteration observed in the organism.

All these facts point to an independent existence of the nucleus. Of this existence we know but little, and there is here a desirable field for careful study and research.

EPILEPSY AND AUTO-INTOXICATION.

DR. C. AGOSTINI (*Journ. Ment. Sc.*, London, July 1897) has made an investigation into the composition and toxicity of the gastric fluid and urine in epileptic insanity at various periods in relation to fits. He finds that in the intervals between the fits, the gastric juice is in most cases normal as far as can be recognised by mere chemical analysis, with, however, a tendency to hyperacidity and especially excess of hydrochloric acid. For a short time previous to a fit, and for some time afterwards, there are changes indicating a condition of transitory [illegible] products that have the general reaction of leucomaines. The administration of bromides distinctly diminishes the toxicity of the urine.

Agostini maintains that in a large proportion of epileptics, the fits are preceded by marked symptoms of gastric catarrh. In the intervals between the fits the catarrh in most cases disappears, but in many it persists, becoming aggravated about the time of the fits. In those patients who have chronic gastric catarrh, the epileptic phenomena are more frequent and more severe. He believes that this chronic or transitory gastric catarrh is accompanied by putrefactive changes in the contents of the stomach and intestines, and the formation of toxic substances which become absorbed and tend to accumulate in the blood, giving rise to the malaise, headache, and furring of the tongue which precede the occurrence of a fit, and finally determining the convulsion or series of convulsions. He has found that all measures tending to the elimination of such toxic products, or to the prevention of their formation, diminish the frequency of the fits, or altogether prevent them. He further believes that the process of oxidation is usually deficient in epileptics. Hence leucomaines absorbed from the intestinal canal are not completely oxidised as in healthy persons. He also thinks it is probable that in epileptics, on account of the morbid functioning of the nervous system, excretory processes take place with abnormal slowness, so that there is a tendency to the retention in the system of products of reduction that ought to be eliminated. These toxic agents need not have epileptigenic properties. They act simply by increasing the vulnerability of the imperfect and unstable nervous system of the epileptic.

Since auto-intoxication plays so important a part in the production of epileptic fits, Agostini advocates the endeavour, as far as possible, to remove the factors of such intoxication. In the first place, correct gastro-intestinal catarrh when it is present, and endeavour to remove toxic substances that may have formed in the alimentary tract. As the best means of attaining this object, he recommends repeated washing out of the stomach with salt water, especially when fits are anticipated, and before the occurrence of a crisis. He also advises the use of purgatives, saline enemas, diuretics (especially lactose), and the abundant administration of milk along with salol or naphthol as intestinal antiseptics. In the second place, endeavour to increase the activity of processes of oxidation and of normal tissue changes in general. These objects, he thinks, are best secured by the use of small doses of alcohol, careful hygiene, fresh air, and moderate muscular exercise. With regard to diet, he does not agree with Haig that epileptics should become vegetarians. He has found that a purely vegetable diet gives even worse results as regards the fits than a purely meat diet, a circumstance which he attributes to the fact that vegetable albumin putrefies more readily than animal albumin. He recommends a milk diet with plenty of milk. Lastly, we should endeavour to diminish the reflex activity of the cortical nerve centres, which in epileptics are in such unstable equilibrium. He believes that the only effective drug for this purpose is potassium bromide. He recommends that it should be given in somewhat smaller doses than those generally used, and that it should be combined with salol. Its efficacy is increased by the antitoxic therapeutic measure already mentioned. If gastric catarrh appears, the administration of bromides should be suspended and the attention directed to the removal of the catarrh.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF

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AND

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Periauricular Abscess following Boils of the External Auditory Meatus.

The presence of a superficial abscess in close proximity to the auricle should always lead to a careful inquiry into the patient's history, and must raise in the surgeon's mind the suspicion of a possible middle ear suppuration, complicated by involvement of the mastoid antrum and cells. A superficial abscess originating from such a cause as this will seriously modify both the surgeon's prognosis and his treatment. Recently attention has been drawn to the possibility of an abscess arising in this situation being secondary to a boil in the external auditory meatus, and so closely simulating mastoid abscess that an error in diagnosis and treatment may follow. M. Lannois (*Rev. hebd. de laryngol.*, Bordeaux, June 11, 1898) had his attention first drawn to this subject from the case of a woman, æt. 30, who had an abscess situated above the pinna, and invading the greater part of the temporal fossa on the same side. There was a history of furuncles, and traces of them were visible on the posterior wall of the meatus. The tympanic membrane was intact. A rapid cure followed opening of the abscess. A second case, unlike the first, presented certain features which might have led to an error in treatment. The patient was sent to the author by a surgeon who was about to trephine the mastoid, but, before doing so, wished an explanation as to the unusual appearance of the superficial abscess. It occupied the area of the apex of the mastoid and the whole of the hollow behind the lower jaw. Lannois recognised the patient as one whom he had cured of middle ear suppuration during the previous year, but whom he had also treated fifteen days before for recurring furuncles of the meatus. Incision of the swelling was followed by the rapid healing of an abscess which was secondary to the boils of the meatus. Here the history of a chronic middle ear suppuration was in support of the view that the abscess might be due to a deeper cause. A third case may be quoted, on account of greater difficulties that were met with. A boy, æt. 10, had been treated for fifteen months for a right middle ear suppuration, and this slowly but completely cured. In October 1897 he was brought in from the country, with the history that for three weeks he had had pain in the right ear, which had ceased and had again come on, accompanied by slight discharge. About eight days before he was examined a swelling appeared behind the jaw. On inspection this was found to be about the size of a small hen's egg; there was fluctuation; it could be defined in front and below, but it was diffuse above and behind, where the extremity of the mastoid was considerably involved in the swelling. There was a little pus in the meatus, which was very swollen, and showed a slight ulceration in the postero-inferior angle. It was impossible to see the tympanic membrane. With the history of the previous middle ear trouble, a fresh purulent otitis was suspected, complicated with involvement of the mastoid cells. The usual incision was made behind the auricle, being prolonged sufficiently far below to open the abscess. There was no lesion visible on the external surface of the mastoid process, and it soon became evident on using the chisel that the mastoid cells were healthy. On exploring the abscess cavity, a fistulous track was found communicating with the external auditory meatus behind the cartilage. Iodoform gauze dressing was used, and rapid cure resulted. A few days later, when it was possible to examine the tympanic membrane, no inflammation was found, but merely an old cicatrix dating from the previous affection. In this case there was a mistake in diagnosis, and by operating upon the mastoid the healthy cells were exposed to a possible infection from the abscess cavity. Leutert has recently written upon this very question (*Arch. f. Ohrenh.*, Leipzig, December 1897), and in one of his cases a similar mistake was made to that quoted above. It is possible that these cases may be more common than is generally supposed, and that it is often difficult to recognise the exact condition that may be present.

Leutert, in discussing the differential diagnosis, says that when an abscess results from a furuncle, the swelling is localised in the retro-auricular furrow, while, if it proceeds from mastoid complication of middle ear suppuration, there is first swelling, then the sense of fluctuation over the outer surface of the mastoid process. If the boil be situated in the superior part of the meatus, and a secondary abscess forms in the upper and anterior part of the ear in the temporal region, one may think of pus which has spontaneously perforated the outer wall of the mastoid antrum, and led to a more or less extensive necrosis of the outer shell of the temporal bone. If, finally, the furuncular abscess appears in the lower part, and collects below the ear, behind the ascending ramus of the lower jaw, one may confound it with inflammation of the apex of the mastoid. If one is forewarned, one will be struck with the fact that in the furuncular abscess the apex of the mastoid process is completely free, or only involved in the œdema of the surrounding parts, and that it does not appear to be the seat of origin of the collection of pus. There are, in fact, indications which can help us in making a diagnosis, if they do not allow us to establish it accurately. Leutert has further given as a differential sign the character of the pus, which in two of his cases consisted of a minimum quantity of fluid matter, and was composed chiefly of masses of partially necrosed connective tissue. In Lannois' cases, however, the pus did not present any such appearance. Such cases are certainly of considerable interest.

Xerostomia, or Mouth-Dryness.

Since the publication of the first recorded cases of this somewhat rare affection by Mr. Jonathan Hutchinson and the late Dr. Hadden, in the *Transactions of the Clinical Society of London* in 1888, some additional cases have been observed and noted. Professor Fraser (*Edin. Hosp. Rep.*, 1893, vol. i.) describes in great detail the case of a young woman who had suffered from dryness of the mouth for eighteen months. A special feature in this case was an associated dryness of the nose and eyeballs, so that the patient was quite unable to shed tears. The value of this paper is further increased by the inclusion of a tabulated account of all the cases of this kind recorded up to 1893. Since that date a few further cases have been recorded, two of these within the last few months, thus bringing this condition more immediately under our notice. At a meeting of the Clinical Society of London, 6th Feb. 1895, Battle (*Brit. Med. Journ.*, London, 16th Feb. 1895) showed a woman who had suffered for five years from mouth-dryness, which was associated with intermittent attacks of parotitis. Every three or four weeks during the last two years the submaxillary glands had recently became enlarged. Riesman is said to have reported a case, also that of a woman, æt. 38, who had complained of the condition for two years (*Phila. Polyclin.*, March 1897).

More recently, Dr. Thomas Harris of Manchester (*Am. Journ. Med. Sc.*, Phila., March 1898) has reported another case of this kind, one which he had previously shown in 1894, and in which there was enlargement of both parotid glands, a condition which had existed during the three years in which the mouth-dryness was complained of; these glands were uniformly enlarged and of firm consistence, and there was an entire absence of pain or tenderness. The orifice of each duct appeared natural, and firm pressure along the course of each caused the expression of some glairy mucus. There was no associated enlargement of the sublingual or submaxillary glands, nor was there any affection of the lymphatics. In this patient there was also a slight dryness of the mucous membrane of the nose, and both taste and smell were interfered with. There was an arrest of secretion of all the buccal glands. The patient, as in the majority of these cases, was a woman. Treatment by tonics, jaborandi, and the faradic current was abandoned, as no relief could be obtained.

In *Lancet*, London, 23rd April 1898, another case is reported by Dr. Sharp of Whitby, in which a single woman, æt. 41, had suffered for eighteen months from constant dryness of the mouth. Here certain features which were present in the previous case were absent; there was no interference with the secretion of tears, no enlargement of the parotid glands, no depreciation of the sense of taste or smell, and little, if any, dryness of the nose. The patient reported that she was improving with medium doses of mercuric iodide and quassia.

These cases are of interest rather from the point of view of their obscure origin, there being no definite explanation of their cause, than from any therapeutic interest attached to them, and it is for that reason that we have briefly recorded here the few notes which we have had access to.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Prophylaxis of Tuberculosis.

M. Grancher (*Rev. d'hyg.*, Paris, tome xx. No. 6) discusses this subject at great length in the Report of the Commission appointed by the French Academy of Medicine. Leaving on one side the chance of infection by food or from suppurating tubercular wounds, he confines his attention to the sputum as the usual vehicle of the spread of phthisis. Two things are necessary and easily done either by the patient himself or his attendant, namely, to carefully collect and destroy the sputum before it gets time to dry, and to wash the floor and furniture of his room instead of sweeping and dusting them. The unwillingness of the physician to tell his patient at the very outset that he has tubercle, prevents him insisting on the necessary precautious with the sputum, etc. But since tubercle is now recognised as a curable disease, there is every inducement, nay necessity, to do this. Such intimation requires great tact, as the family desire as a rule nothing more than to be deceived on such a point. He must cease to allow the ideas of heredity and incurability to paralyse his action, but turn to the stimulating ideas of curability and contagion. Such cure can only be made by prolonged treatment and rigorous attention to rule, and this will only be undergone by the patient when he knows his danger and his chance of cure. It is most important that the diagnosis be made in the earliest stages before the bacilli appear in the sputum, as at this early stage there is greatest chance of cure, and, further, there is no danger of infecting others. One must be content with a diagnosis of probability, watching carefully as the loss of strength and of flesh increases, for any permanent change of the sounds at the apexes of the lungs. As an aid in diagnosing obscure cases, Escherich and Epstein have used tuberculin, but this can only be recommended in hospitals, when its action can be rigorously watched and controlled. The use of the Röntgen rays has also been recommended. But the physician should at present trust only to tried and recognised clinical signs for forming his diagnosis. The times are not ripe for getting tubercle placed among the notifiable diseases, and the stated periodical disinfection of rooms occupied by phthisical patients would involve a large disinfecting staff and great expense. Moreover, such disinfection is quite unnecessary if the patient be led to use, when outside, a small pocket spittoon instead of his handkerchief, and in his room a special spittoon having some disinfectant in it. The contents of both of these must be destroyed before the sputum can dry. In sanatoria for the tubercular, such measures are rigorously carried out, and far from becoming centres of infection, a residence in them often results in cure. Besides, patients who return home uncured, have learned the means necessary for preventing them infecting other members of their families. In the continental armies tubercle is very common. In the French army there has been a progressive increase of cases from 1888 to 1895, from 5·48 to 10 per 1000. In the British army there are 3·5 per 1000, and this is decreasing. Among the general conclusions of the Commission, they suggest that all tubercular patients in hospitals be isolated in separate wards or pavilions until special sanatoria be provided. That in these antiseptic measures be adopted, that there be no fissures in the flooring in which bacillary dust could lodge, and that the floors be never dry-swept. As regards the carcases of animals for use as food, those only which present appearances of general tuberculosis should be entirely destroyed.

Contagiousness and Heredity in Tuberculosis.

At the recent meeting of the Balneological Society in Vienna, Dr. Römpler communicated a paper on this subject (*Deutsche Med.-Ztg.*, Berlin, 1898, No. 35). In England, forty years ago, Dr. M'Cormack stated that phthisis was no more communicable by contagion than broken legs, and Aufrecht has recently asserted that phthisis is in no sense an *exquisite infectionskrankheit*, as Koch described it. No one has been able to produce experimentally in an animal a process like phthisis, beginning on the apexes of the lungs and often confining itself to the lungs, and going on to destruction of lung tissue. Flügge, though he believes with Cornet that phthisis is contagious, does not agree with him in stating that dried particles of sputum can infect, but considers that such infection can be produced by the fine particles charged with bacilli which are emitted from the mouth of a phthisical patient on vigorous speaking, coughing, etc. But does this view accord with actual experience? None of the great laryngologists of Germany, who must have been exposed to this frequently, were ever infected. Superintendents of asylums more frequently become insane than directors of sanatoria for the phthisical become tubercular. In most of the continental armies the highest percentage of tubercular disease is in the first years of service. It cannot be that the bacilli are less active in later years. During his twenty-three years' directorship of an institution for lung diseases, he only saw one case among the attendants that could be attributed to contagion. Of twenty-three persons whose duties in the institution brought them into close contact with the patients, whose time of constant service ranged from twenty-three years to seven years, not one took phthisis. He quotes Aufrecht: "During seventeen years there were admitted into the Magdeburg-Altstadt Hospital 3820 persons suffering from phthisis, of whom 1620 died. These cases were attended by 240 male and female attendants, and not one took phthisis."

Haupt (*ibid.*, No. 40) points out that of 2628 cases of phthisis treated at his institution at Taunus, 1732, or about two-thirds of the whole, were hereditary. There is no reason to believe that contagion plays a large part in the spread of phthisis, much less that it is the only factor. In his institution during the last thirty years there had been 653 attendants on the patients. Fifteen of these took phthisis, two-thirds of which were found to have heredity. [illegible] were one of the parents was phthisical [illegible] 127 [illegible] healthy. [illegible] can never [illegible] of the [illegible] and poverty which have such a share in its [illegible] and this [illegible]

[illegible] HOSPITALS

[illegible] *Hyg.*, [illegible] left [illegible] hospitals [illegible] 80 to [illegible] them [illegible] the cause [illegible] which [illegible] such [illegible] much [illegible] department [illegible] Hospital [illegible] which [illegible] During [illegible] –93, 169 [illegible] were [illegible] admissions [illegible] 74·75 per [illegible] in 18[illegible] 345 [illegible] 55·5 per [illegible] During [illegible] –96 the [illegible] with [illegible] 109 of which [illegible] a week [illegible] During [illegible] there were [illegible] admissions, with [illegible] of which [illegible] a week [illegible] admission [illegible] children [illegible] age of [illegible] younger [illegible] of entire [illegible] in both [illegible] mortality [illegible] per cent. [illegible] and [illegible] in 18[illegible] condition of [illegible] at time of [illegible] mea[illegible] weight, was [illegible] year[illegible] was much less [illegible] normal [illegible] about [illegible] differed from [illegible] diseases [illegible] occurring [illegible] after admission [illegible] hardly [illegible] any co[illegible] [illegible] who had been [illegible] always [illegible] the mort[illegible] than [illegible] hospital, b[illegible] –96 49 per cent. [illegible] while in 189[illegible] 14·6 per [illegible] improvement [illegible] so [illegible] [illegible] But in the [illegible] the babies [illegible] in new [illegible] better ventilat[illegible] and [illegible] provided [illegible] could more [illegible] taken [illegible] of inf[illegible] there was no [illegible] though still [illegible] means [illegible] ous cases. [illegible] ful effects [illegible] the hos[illegible] [illegible] in their [illegible] tion, but are e[illegible] freedom from severe [illegible] disease were [illegible] of high mortality, each case [illegible] preceding one. [illegible] in our hospitals consists [illegible] infectious gastro-enteritis [illegible] and may begin without [illegible] in their etiology, and [illegible] which are not infectious [illegible], as a rule, continues [illegible] become subnormal. Slight [illegible] There is acute diarrhœa [illegible] twenty-four hours. [illegible] and post-mortem appearances [illegible].

THE DESTRUCTION OF PATHOGENIC ORGANISMS IN MANURIAL MATTER.

PROFESSOR GAERTNER (*Ztschr. f. Hyg.*, Leipzig, Bd. xxviii. Heft 1) contributes the results of his investigations. The experimental manure heaps were 8 ft. × 5 ft. × 3 ft., and were composed respectively of stable and cow manure with and without straw, of garden earth mixed with fœcal matter and peatmoss with and without the addition of some sulphuric acid (which in Germany is often added to peat moss to give it a disinfecting power, specially against the comma bacillus). The organisms experimented with were those of cholera, typhoid fever, tubercle, hog erysipelas, and fowl cholera. Cultures of these were rubbed up in different media, and placed inside the heaps. The temperature inside the heaps of stable manure rose in a few days to 70° C., but in fæcal manure it never rose above 30° C., and, as a rule, it was much lower. The higher the temperature the quicker were the organisms killed, but there are other factors at work, specially the want of oxygen and excess of carbonic acid.

In summer the pathogenic organisms die more quickly than in winter, and their existence in such heaps through the whole winter cannot be seldom. This is specially the case with the bacillus of fowl cholera and of tubercle. He finds that *Bacillus cholera* and *typhosus* can live longer than one week; bacilli of hog erysipelas more than fourteen days; and bacilli of fowl cholera and of tubercle more than one month. There is no reason to think that cholera and typhoid stools, if thrown on a dung-heap, would be sterilised as quickly as is shown above, as the contents of the bowel are more favourable to the growth of these organisms than the culture media (broth, etc.) used in experiments.

into the cavity of the pelvis.

ANALYTICAL REPORTS.

Cadbury's Cocoa.

It is hardly necessary now-a-days to call attention to the products of the famous firm of Cadbury. Still, as they have submitted samples of their Mexican chocolate and cocoa essence to us, we have, in renewing our acquaintance with them, had no occasion to alter our opinion as to their merits. Their Mexican chocolate is most appetising, and is not too sweet. Many persons are unaware of the sustaining powers of chocolate, and of the large amount of nourishment obtainable from it. Chocolate on the average contains 5·06 per cent. of nitrogenous matter, 15·25 per cent. of fat, and a varying amount of sugar—from 20 to 60 per cent. As only about 1·5 per cent. of water is present, compared with the 72 per cent. of water in lean beef, it affords in much less bulk a most nutritious food, well adapted for the conservation of energy on occasion. On long excursions, walking tours,—in fact, on all expeditions,—chocolate can be used as a source of energy, especially convenient owing to its lack of water and consequent small bulk. The proportion of protein in it is not sufficient to sustain life if taken alone without the consumption of a great excess of fat and sugar, but this very excess of fat and sugar renders chocolate most valuable as a heat-producing food. Cadbury's Mexican chocolate will answer this purpose most excellently.

Cadbury's cocoa essence is an absolutely pure preparation from cocoa nibs alone, minus some of the excess of fat, which may cause it to be rather indigestible. The amount of fat in cocoa nibs reaches 49–50 per cent., with 13·3 per cent. of carbohydrates; and 14·76 per cent. of nitrogenous substances. Removal of excess of fat, leaving about 20 to 25 per cent., renders the relations of the remaining constituents to each other very similar to those present in cow's milk. The proportion of flesh-forming material in the dried solids of milk is given by Johnson as 35 per cent., that of Cadbury's cocoa essence is estimated at 34·75 per cent.

The use of cocoa essence in place of the cocoas commonly employed, affords, with boiling water, a pure infusion of the cocoa bean, in consistence more akin to infusions of tea or decoctions of coffee than to the mixture generally obtained; should the palate demand the addition of sugar, it may be added; should a richer solution be desired, infusion with boiling milk will afford it. As no starch is added, its infusions are not cloudy, but it is not of less strength on this account, rather of greater power.

Table Waters.

(R. ELLIS AND SONS, RUTHIN, WALES).

Messrs. Ellis & Sons have submitted for our approval a hamper of their celebrated aerated table waters. We confess to an analysis of the majority of the samples by means of the palate; after all, this method is probably the best, with certain precautions.

First, we may say that their "Brewed Ginger Beer," sent out in stone bottles, their "Aromatic Ginger Ale," and their "Non-alcoholic Dry Ginger Ale," are most palatable. The last-named is by far the most delicately flavoured, mildest, and most delicious ginger ale we have ever tasted. It has none of the crude, raw taste so frequently found in rudely made mixtures of water, flavouring reagents, sugar and carbonic acid gas, which are dignified by the name. The "Brewed Ginger Beer" is also exceedingly pleasant, and is certainly not so dry. Their "Champagne Lemonade" is an excellent example of its class, and is not so sweet as some others we have encountered. Excess of sugar in these beverages must prove of advantage to their manufacturers, owing to the subsequent increase of thirst, not to mention the inducement given by the formation of alcohol, often to no small amount, from it. The samples sent us are the reverse of this, and are therefore much more refreshing.

The soda, potash, and seltzer waters sent could not be better. They were all acid when the cork was first removed, while the first two became alkaline on driving off the carbonic acid gas, present under quite sufficient a pressure, to judge by the vagaries of the corks. The alkalinity is equal to officinal standard.

A special mineral water for the table made by Ellis & Son was also included, "Cymralis, the Royal Welsh Table Water," a strongly effervescent water with a crisp, pleasant taste, or rather sensation, for it has no discoverable taste, save that of a pure aerated water, containing small quantities of mineral matter. Alone or in combination it is excellent.

One thing only we would suggest to the makers, that they would be well advised if they adopted some of the new methods of closing up bottles with effervescing contents, rather than the old and more cumbrous cork and wire.

Valtine Meat Globules.

(THE VALENTINE EXTRACT COMPANY LIMITED, LONDON.)

Although to the making of meat extracts and concentrated preparations there is apparently no end, the samples of meat globules sent by the above-named Company are really ingenious enough to merit a detailed description. The beef extract in this case, made "after Liebig," with modifications and improvements, is supplied in gelatine capsules of various sizes. The larger series is for use in the preparation of beef-tea, soups, or gravies. The second series is composed of capsules or globules small enough to allow of their being swallowed. Each globule or capsule contains some of the beef extract, the larger just sufficient to yield a cup of beef-tea or soup, which is ready for drinking in a few seconds after boiling water has been added; the smaller globules contain a measured quantity of the extract, are easily carried in a flat box in the waistcoat pocket, and can readily be swallowed if a little fluid be also taken. We can only see one drawback to their use by some of the various classes of men mentioned in the notice of the globules sent with them, and that is the necessity for drinking some fluid before they can, in most people, be made to descend into the stomach; and sometimes water is hard to get, or what can be got is not very aseptic.

The large globules weigh 5·6 grms. (87·27 grs.), and two of them are equal to seven of the smaller, which weigh 1·6 grms. each (24·93 grs.). A small deduction for the gelatin must be allowed for, to arrive at the true amount of extract. More novel, perhaps, are the little tin pill boxes sent out with the larger globules, each tin containing a number of "flavour peloids." These are compressed tablets of salt and other condiments, in three degrees of strength and three shades of colour. The red tablet is for the patient who prefers his soup or beef-tea strongly flavoured with piquant condiments, the yellow for the average individual, and the brown for him who abjures such additions. When only the strong peloids are left, and it is not desired to flavour the soup too highly, it can be poured off from the remainder of the peloid when sufficiently tasty, leaving the undissolved portion behind. We have felt for long that some practical and handy method of flavouring invalids' beef-tea and soup would be of great benefit. The domestic maker of beef-tea or soup generally flavours them to his or her taste, and which may not be the patient's. One of these peloids (or two, as the patient approves) can be used with advantage; and, indeed, the flavour of the liquid may be altered by varying the peloid used, thereby to some degree warding off the distaste inevitably brought on by monotony in the intensity and kind of flavour continually supplied.

TASTELESS PILLS.

(ARTHUR H. COX AND CO., BRIGHTON.)

We had occasion to describe not so long ago some of Cox's patent tasteless pills. A fresh sample of these elegant preparations has been sent us of a pill with a formula which should render it of excellent service where a tonic is indicated, both for anæmia and its frequent ally, nervous weakness. The pills contain $\frac{1}{50}$ gr. phosphorus, $\frac{1}{40}$ gr. strychnine, $\frac{1}{2}$ gr. of sulphate of quinine, and 3 grs. of reduced iron. The formula speaks for itself, while the pills are most elegant products of the pharmaceutical art.

Taking advantage of an opportune chance offered us to test the value of these pills, in a case which appeared to indicate the exhibition of their constituents in one or other form, we gave them a trial and found the results to be very satisfactory. The patient suffered from anæmia with nervous manifestations, and derived considerable benefit from the treatment. There is no doubt that a pill-mass, coated as in these pills, does not tend to harden with keeping, and remains as effective as if taken in recently-filled gelatin capsules.

As many patients find capsules hard to swallow, generally from some curious pharyngeal fancy, but can manage to take a pill, the advantage of being able to ensure that pills can be obtained in bulk, in a practically permanent form, is easily apparent. We confess also to a preference for pill-masses, if kept moist, against a number of the compressed discs so common now-a-days, and many of which, if kept for some time, are prone to reappear unchanged after ingestion.

AMIRAL SOAP FOR OBESITY.

(THE "AMIRAL" SOAP SYNDICATE, LONDON.)

AMONG the various methods from time to time suggested for lightening the weight of obese individuals, we do not remember having seen or heard of any in which a soap was recommended as the active agent. But now the "Amiral" Soap Syndicate offer a soap which they claim can reduce the amount of fatty tissue in and under the skin of the part to which it is applied. The soap which is said to produce this result, and the truth of the statement is supported by private testimonials from many medical men, is green in colour, possesses a pleasant odour, and is evidently superfatted. The active agent included in it consists of an extract, carefully purified, of animal bile. Ox-gall in a dry state forms one of the best soaps possible even when used alone. Bile has a powerful saponifying action on fats, and appears to penetrate animal tissues very readily. It is quite possible to suppose that its use incorporated in a superfatted soap may remove more of the fat of the skin than ordinary soaps, and also remove it from a deeper area. Should a person be oppressed by the measure which his body has attained, he may get relief by rubbing a cake of this soap, moistened with water, over the skin of the most obtrusive part, forming a lather, which after three or four minutes is sponged off; the hand must not be used in applying the soap; this, twice daily, until three or four tablets have been used, when, as a rule, the subcutaneous fat is less in bulk. Should the more extended use of this "savon de l'amiral" prove to be a powerful extractor of the fat of the body, victims of obesity wishing to lighten their burdens will surely acknowledge the benefit conferred on them in the non-existence of any call for special dietary or drugging. The soap does not irritate the skin.

As we are not the possessor of too large an amount of fat, and as we are at present unacquainted with anyone of large substance desirous of reduction, no opportunity has been presented for the trial of the powers of the soap.

SELF-RISING FLOUR, RISO BRAND.

(HENRY ROBERTS AND SON, MOLD.)

A SAMPLE of the flour, when subjected to investigation, showed that it is absolutely free from alum, is made from the proper parts of wheat, and is evidently an article of the highest quality. Subjected, further, to the test of the palate, the Riso flour made very good well-flavoured scones, which were porous and rose well without the addition of any baking-powder. The only precaution which has to be taken when it is used, consists in the necessity for rapid mixing before, and quick baking during, its stay in the oven. The flour in all probability has bicarbonate of sodium and some organic acid—tartaric, possibly—in it, in a dry condition, so that procrastination in kneading the dough will lead to premature evolution of carbonic acid gas. It is claimed for the Riso flour that it possesses remedial properties for indigestion. The sample sent us was not of sufficient bulk to allow this side of the question being investigated, but the articles made from it tasted well, were light, and therefore should be of easy digestion.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FIVE WEEKS ENDING JULY 2, AND FOR THE YEAR FROM JANUARY 2.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 2.	Actual.	Accumulated from Jan. 2.	
		Above 42°.	Below 42°.					
Mean	54°·1	*[1] 385° [2] 831°	3° 649°	1·8	13·6	208	720	2°·6
Observed	53°·3	[1] 401° [2] 914°	4° 427°	1·8	12·2	187	689	2°·1
Difference	−0°·8	[1] +16° [2] +83°	+ 1° −222°	±0	−1·4	−21	−31	−0°·5

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND, DURING JUNE, AND SINCE JANUARY 1. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Nervous System.		Respiratory System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 1006 [2] 6864	179·8 202·4	229 1326	40·6 39·1	97 650	17·2 19·2	119 775	21·2 22·74	176 1464	31·3 43·15
Actual Deaths and Rate per 10,000	[1] 1090 [2] 6713	193·0 198·0	237 1460	42·0 43·0	105 658	18·6 19·4	112 777	19·9 22·9	141 1235	24·9 36·4
Difference from Mean	[1] + 84 [2] − 151	+13·2 − 4·4	+ 8 +134	+1·4 +3·9	+8 +8	+1·4 +0·2	− 7 + 2	−1·3 +0·6	− 35 −229	−6·4 −6·75

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 70 [2] 399	12·4 11·8	28 170	4·9 5·0	76 531	13·4 15·67	116 677	20·5 19·9	52 283	9·2 8·3
Actual Deaths and Rate per 10,000	[1] 81 [2] 481	14·3 14·2	19 156	3·3 4·6	83 555	14·7 16·37	116 696	20·5 20·5	51 334	9·0 9·8
Difference from Mean	[1] +11 [2] +82	+1·9 +2·4	− 9 −14	−1·6 −0·4	+ 7 +24	+1·3 +0·7	± 0 +19	± 0 +0·56	− 1 +51	−0·2 +1·5

* NOTE.—The figure [1] denotes the data for June, [2] for year to date.

During the five weeks ending 2nd July 1898, only two meteorological elements showed any marked divergence from the normal for the month of June, *i.e.* the sunshine duration and the mean daily variability of temperature; the one with a defect of twenty-one hours, or 10 per cent. of those expected; the other a defect of 0°·5, or nearly 20 per cent. of the mean. The mean temperature was slightly below the average, chiefly owing to the cold experienced during the week ending 4th June, when the mean for the week was 4° below the average. The days were warmer, the nights colder than ordinarily. The rainfall was equal to the average.

From 1st January the most marked feature has been the great diminution in the number of day degrees below 42°, with the less pronounced increase of those over 42°. The rainfall for the half-year is 10 per cent. below that expected.

The number of deaths occurring during June was larger than usual by 13·2 per 10,000, due rather to deaths from zymotic diseases than from those dealt with here. Among those types individually discussed, there are no marked instances of any increase; the respiratory system, on the other hand, contributes yet another addition to the accumulated deficit for the year. Influenza is credited with causing twelve deaths.

From 1st January, the figures for the half-year have not materially altered since last month, save in the increased defect of fatal cases from respiratory disorders—229, or 15 per cent. of the total looked for.

The month of June, therefore, characterised by very cold sunless weather at first, was, on the whole, an average month, as regards temperature and rainfall, but very deficient as regards bright sunshine, and with smaller changes of temperature from day to day than usual, shows an increased death rate, but no marked increase under any of the factors treated of, while the deaths from lung diseases are much below the usual. The figures for the year to date coincide.

MEDICAL NEWS.

School of Medicine of the Royal Colleges, Edinburgh.—At a meeting of the Governing Board of the School of Medicine of the Royal Colleges, Edinburgh, the secretary, Mr. R. N. Ramsay, reported that the number of students attending the School during the Summer Session was 1239.

THE ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

In last month's number a brief account of the connection between the British Medical Association and the medical profession in Edinburgh in former years was published. It will not be out of place if we now include notes of the salient features of the present meeting, as arranged for by the different committees.

As we have already seen, the previous meetings of the Association held in Edinburgh took place in 1858 and 1875, both of which years form memorable periods in the history of medical science. The present meeting, the third of the series, commences on Tuesday, July 26th, and ends on Friday, the 29th. Saturday, July 30th, may however be regarded as officially recognised as a component atom, even if it be only devoted to the cultivation of the material senses, rather than of the intellectual powers.

Last year the British Medical Association met at Montreal, under the presidency of Professor Roddick of M'Gill University. This year Professor Sir Thomas Grainger Stewart, M.D., LL.D., occupies the post. The presidency of the Council is filled by Robert Saundby, M.D., LL.D.; and the treasurer of the Association is Charles Parsons, M.D. The honorary local treasurers are C. E. Underhill, M.B., and P. A. Young, M.D.; the honorary secretaries are R. W. Philip, M.D., and J. Shaw M'Laren, M.B.

The total number of members—17,746 as at present—reaches to as much as 1473 in excess of that of 1897; a record yearly increase.

The annual addresses form an important part of the business. This year they fall as follows:—MEDICINE, Professor Fraser; SURGERY, Professor Annandale; PSYCHOLOGICAL MEDICINE, Sir John Batty Tuke.

In the sixteen scientific sections the post of President is held as under:—

A. MEDICINE.—George William Balfour, M.D., LL.D.
B. SURGERY.—John Duncan, LL.D.
C. OBSTETRICS AND DISEASES OF WOMEN.—Alex. Russell Simpson, M.D.
D. STATE MEDICINE.—Sir Henry D. Littlejohn, M.D., LL.D.

E. PSYCHOLOGY.—Thomas Smith Clouston, M.D.
F. NEUROLOGY.—Byrom Bramwell, M.D.
G. PATHOLOGY.—William Smith Greenfield, M.D.
H. PHARMACOLOGY AND THERAPEUTICS.—James Ormiston Affleck, M.D.
I. OPHTHALMOLOGY.—D. Argyll Robertson, M.D., LL.D.
J. LARYNGOLOGY AND OTOLOGY.—P. M'Bride, M.D.
K. DISEASES OF CHILDREN.—Joseph Bell, M.D.
L. DERMATOLOGY.—William Allan Jamieson, M.D.
M. MEDICINE IN RELATION TO LIFE ASSURANCE.—Claud Muirhead, M.D.
N. TROPICAL DISEASES.—Patrick Manson, M.D., LL.D.

DISCUSSIONS.—It would take up too much space were we to instance all the subjects chosen for discussion by the members attending the various sections. In noting most of them no reflection as to the importance of any not mentioned is intended.

In Section A, hepatic cirrhosis, vascular tension, and serum diagnosis in infective diseases, are to be discussed. Section B applies the energies of its members to the elucidation of injured elbows and infected urinary tracts. Section C considers pelvic inflammation, and animadverts on midwifery forceps. Section D discusses river pollution, vaccination, and milk. In Section E, suicide and hypnotism form subjects of debate. Intracranial tumours and the effects of toxins come up in Section F. Leucocytosis occupies Section G. Treatment of stomach diseases and of chronic kidney disease take up the attention of Section H. In Section J, the relative value of experimental and clinical observations upon regions of the body, special to the Section, will be discussed. In Section K, spinal caries, congenital syphilis and rheumatic heart disease in children, form the topics; as, in Section L, do the nature of lupus erythematosus, and a conundrum as to eczema. Sections M and N are both new sectional developments; the former argues upon the influence of heart disease, of otitis media, and of limited family vitality upon life insurance; and the latter deals with beri-beri and plague. In Section O, that of Anatomy, the significance of anatomical variations will be considered; and in that of physiology, Section P, the technical subjects to be thrashed out comprise questions relating to the production of the different qualities of sensation, and as to methods of absorption from the intestine.

DEMONSTRATIONS.—In the Neurology Section a demonstration of preparations—transparencies, specimens, and microscopic sections—and of patients, connected with the subject of the section, is held. Section H devotes part of the time available to a practical demonstration of various novel gastric appliances. The Dermatological Section holds a clinical meeting in the Royal

Infirmary, while Professor Symington will illustrate cranial topography by means of transparencies.

PATHOLOGICAL MUSEUM. — A collection of pathological specimens, microscopical sections appertaining to the various Sections, is exhibited in the University Dissecting-Room.

ANNUAL EXHIBITION.—This museum is located in the Drill Hall, Forrest Road, a spacious building well adapted for the purpose.

MEETING PLACES.—The M'Ewan Hall serves as the venue of the General Meetings and Graduation Ceremonial. The Sections are accommodated in the various class-rooms and theatres of the University New Buildings, while the Annual Dinner takes place in the Music Hall.

ENTERTAINMENTS.—The Right Hon. the Lord Provost holds a Reception on the evening of the first day of the Meeting, in the Museum of Science and Art; the Local Branch gives a Reception on the second in the M'Ewan Hall; while the Lord Provost and the Magistrates of Edinburgh give a Reception, followed by a Ball, on the evening of the closing day. Numbers of private entertainments have been devised, including Garden Parties at Dalkeith Palace and Hopetoun House.

Garden parties are to be given by the Royal College of Physicians, Professor Balfour, and Dr. Clouston, and Receptions by the Royal College of Surgeons and Royal Medical Society; a Soirée by the Local Committee; and a Conversazione by the Ladies' Committee.

The Local Executive in charge of practical details consists of a large number of officials. The General Reception Committee is presided over by Dr. G. A. Gibson. The Finance Committee owns Dr. Underhill as its chief. The foreign guests are looked after by Professor A. R. Simpson; the dinner is subject to a Committee presided over by Sir John Batty Tuke; the Excursions are under the care of Professor Chiene; the General Purposes Committee is presided over by Dr. Clouston. The Annual Museum is managed by Dr. Haultain; the Pathological Museum by Sir John Struthers.

HONORARY DEGREES.—The University of Edinburgh on Saturday, July 30, confers on a number of the most celebrated members and guests of the Association the honorary degree of LL.D. The recipients of the degree include Dr. Bowditch, Sir William Broadbent, Drs. Lauder Brunton, Doyen (Paris), Ferrier, Forster (Strasburg), Keen (Philadelphia), Kocher (Bern), Martin (Berlin), Mikulicz (Breslau), Morselli (Genoa), Osler (Baltimore), and Roddick (Montreal).

Foreign Guests and Visitors.—Among the other foreign savants who have intimated their intention of accepting the invitation of the Association, and of taking part in the Sectional work, are:—

Sir James Grant (Ottawa), Drs. Ewald and Landau (Berlin), Salter (Amsterdam), Benedikt (Vienna), Thoma (Dorpat), Snellen (Utrecht), Biedert (Hagenau), Baginsky (Berlin), Boeck (Christiania), Nuël (Liège), Stewart (Cleveland), Turck (Chicago), Schott (Nauheim), Casper (Berlin), Duranti (Rome), Moncorvo (Rio), Unna (Hamburg), Stein (Moscow), Curtis (New York), Marie (Dun-sur-Auron), Murella (Brieg), Pierson (Linderhof), Macdonald (New York), Dercum and Roberts (Philadelphia), Rovsing and Melchior (Copenhagen), and Sänger (Leipzig).

A list of the British members of more than local celebrity, who intend to join in the work of the meeting, would occupy far too much space to be inserted here.

EDINBURGH
MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

THE MOVEMENTS OF THE HEART IN HEALTH AND DISEASE.

By JAMES MACKENZIE, M.D., *Burnley*.

THE movements of the heart in a healthy person are usually so obscured by the lungs that only very little change is discernible in the external chest wall. In many cases the lungs are so voluminous, or the chest wall so fat and thick, that no movement can be detected. But when a large surface of the heart is directly exposed to the chest wall, either from increase in the size of the heart, the lung being displaced, or from retraction of the lung, as in certain cases of disease of the left lung, a series of movements due to the contraction and expansion of the heart can be recognised. The movements thus discernible are not the same in all cases, but depend on which part of the heart's surface comes in contact with the chest wall and other yielding structures in the immediate neighbourhood of the heart. These movements take place so rapidly that it is difficult to interpret their significance by the unaided senses. As many writers on this subject have drawn elaborate, but nevertheless erroneous, conclusions from observations based entirely on the evidence of their senses, it seems to me that accurate observations by the graphic method only can furnish a clear and definite explanation.

SEC. 1. THE APEX BEAT.—The chief movement, and the one which is usually most apparent, is that caused by the forward and outward projection of the apex of the heart during the ventricular systole—the apex beat. This is generally described as "the lowest and outermost point of the heart's impulse which strikes against the chest wall." It is usually felt in the fifth left interspace, immediately inside the nipple line in healthy adults. It may, however, be situated in the fourth interspace and outside the nipple line in children and in some adults. In disease of the heart it alters its situation with the increasing size of the heart. This forward thrust only occurs when the left ventricle is in contact with the chest. As will be shown later, a movement of another description occurs when the right ventricle constitutes the so-called apex beat. That the apex beat due to the left ventricle is a distinct displacement of the heart forward can be recognised by the senses of touch and sight. During the whole time occupied by the systole of the ventricle the apex is usually kept projecting into the interspace, so that in such a tracing as Fig. 1 the lever taking the tracing is kept raised during the whole time of the outflow from the ventricle (Space E'). If the left ventricle is much hypertrophied, the same movement can sometimes be detected in the interspaces immediately above and below. If the interspaces be fairly open and the chest wall thin, and the tip of the finger be thrust into the third or fourth interspace near the sternum, the right ventricle can be felt hardening, and remaining thus hardened in contact with the finger during the whole period of the ventricular systole. It cannot, however, be averred that in this case there is a forward thrust. The heart here is always in contact with the chest wall, and the finger pushed into the interspace during the diastole in all likelihood impinges against the lax ventricular wall. As soon as the ventricle hardens, the finger recognises this hardening as something pushing against it. This sensation of a thrust is sometimes actually synchronous with an indrawing of the soft structures filling up the interspace (Fig. 6).

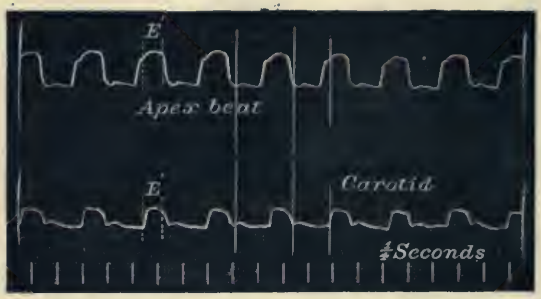

Fig. 1.—Simultaneous tracings of the apex beat and the carotid pulse, showing the "systolic plateau" in the cardiogram during the outflow from the ventricle (E').[1]

Sec. 2. Interpretation of a tracing of the apex beat, due to the systole of the left ventricle.—A tracing of the apex beat, or cardiogram, is a diagrammatic representation of—(*a*) The forward movement of the apex of the heart while the ventricular muscle is contracting (Space *D*, Fig. 2); (*b*) the retention of the apex beat against the chest wall while the ventricles are emptying (Space *E*, Fig. 2); (*c*) the backward movement of the apex of the heart while the ventricular muscle is relaxing (Space *F*, Fig. 2); (*d*) and the gradual swelling of the ventricle during diastole (Space *G*, Fig. 2).

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[1] In the tracings the standard of time is sometimes the radial pulse and sometimes the carotid. The time lost by the wave travelling from the heart to the artery has been allowed for when a comparison has been made between the heart movement and the arterial pulse, so that the spaces E and E' in all the tracings represent the duration of the ventricular outflow as it affects the pulse or the heart.

(*a*) *The period of contraction of the ventricular muscle* (Space *D*, Fig. 2).—During this period the pressure within the ventricle is rapidly rising. The auriculo-ventricular valves close as soon as the pressure within the ventricle rises above that in the auricle. As soon as the pressure in the ventricle rises above that in the aorta and pulmonary artery, the semilunar valves open. This occurs at the end of the period *D* (Fig. 2), and is usually indicated by the abrupt termination of the up-stroke. In Fig. 2 simultaneous tracings were taken of the pulmonary artery and apex beat. As the beginning of the pulse in the pulmonary artery indicates the opening of the semilunar valves, so it is found that the end of the period (*D*) corresponds exactly with the beginning of the pulsation of the pulmonary artery. When this figure was taken the cylinder was rotated rapidly, in order to separate the events as widely as possible. When the cylinder rotates at a slower rate, this period is represented by an almost perpendicular line (Fig. 3). It will be noted that the termination of the upstroke corresponds exactly to the beginning of the outflow of the ventricle into the artery. These tracings were taken from a lad suffering from phthisis of the left apex. The lung had

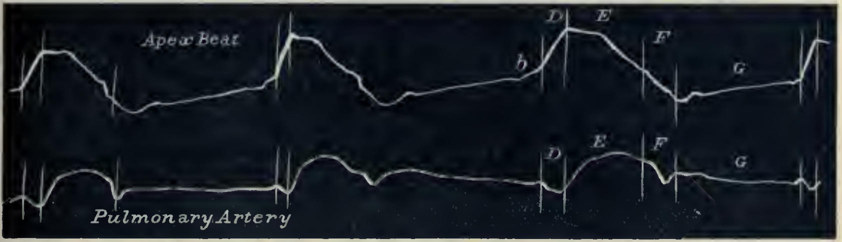

Fig. 2.—Simultaneous tracings of the apex beat and of the pulsation in the pulmonary artery. The letters represent the time during which the ventricle is passing into systole (*D*), emptying (*E*), relaxing (*F*), filling (*G*). *b* represents the small wave due to the auricular systole. While this tracing was being taken the cylinder was rapidly rotated.

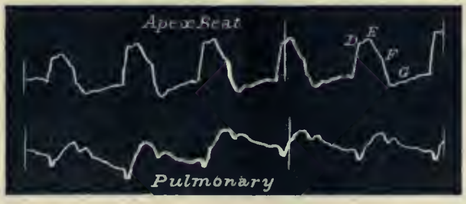

Fig. 3.—Simultaneous tracings of the apex beat and of the pulsation in the pulmonary artery. The letters have the same significance as those in Fig. 2.

retracted from the heart, and through the thin chest walls the various movements of the heart could easily be observed. In the second left interspace there was a marked pulsation. Tracings of the pulsation taken at the same time as the carotid pulse left no doubt as to its being caused by the pulmonary artery (Fig. 4). It will be noticed that the carotid pulse appears just a very little later than the pulmonary. Here also, after a few beats, the cylinder was rapidly rotated with the hand, to separate more widely the different events.

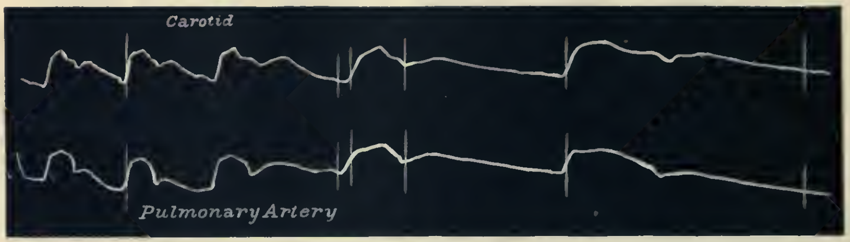

Fig. 4.—Simultaneous tracings of the carotid pulse and of the pulse in the pulmonary artery. During the last three beats the cylinder was rapidly rotated.

(*b*) *The period of ventricular outflow* (Space *E*, Fig. 2).—When the pressure in the ventricles exceeds that in the aorta and pulmonary artery the semilunar valves open, and the blood flows out from the ventricles. During this period the apex is usually kept stationary, protruding against the chest wall, and in many tracings it is shown by a fairly level line—the systolic "plateau." In place of a flattened top, representing the period of ventricular outflow, the tracing may continue to rise, as in Fig. 1, indicating that the ventricle is still slightly shifting. On the other hand, the tracing sometimes rapidly descends (Figs. 2 and 3). I cannot but think that this is due to the shrinking of the ventricle, during its systole, away from the interspace. I shall show later on that this shrinking can be demonstrated in various places, and I have found evidence of it immediately under an enlarged apex beat. The movement producing the apex beat is really a displacement of the heart forward, and while the heart is thus displaced the ventricles shrink in their emptying. If the lower edge of the apex just impinges in the interspace, it is possible that at the beginning of systole the apex is in the interspace, but as shrinkage goes on it partially recedes. The termination of the ventricular outflow is occasioned by the pressure in the aorta becoming higher than that in the ventricle. In consequence of this the semilunar valves close, the ventricular muscle relaxes, and the systolic period terminates at the beginning of a sudden descent in the cardiogram.

(*c*) *The period of relaxation of the ventricular muscle* (Space *F*, Fig. 2).—With the relaxation of the ventricular muscle the apex retreats from the chest wall, as is indicated by the slanting downstroke in the tracing. Where the tracing is falling during the ventricular outflow (*E*), the beginning of this period (*F*) is indicated by a more rapid descent (Figs. 2 and 3). During this period the ventricular pressure is rapidly falling until the stage of complete relaxation, when the pressure inside the ventricles becomes lower than that inside the auricles. When this occurs the auriculo-ventricular valves open. The apex then has retreated its furthest from the chest wall, and in the tracing the lowest point is reached.

(*d*) *The period of filling of the ventricles* (Space *G*, Fig. 2).—Following upon the opening of the auriculo-ventricular valves the blood flows from the auricles into the ventricles. As the ventricles distend, the heart pushes against the intercostal space and slightly raises the lever. This period is marked in the tracing by a gradual ascent. Frequently, however, the heart fails to affect the tissues in the interspace during this period, so that no indication of the filling of the ventricles is obtained; therefore, in such a tracing as Fig. 1, nearly the whole of this space is a blank, so far as the heart is concerned. In tracings where this period is represented, there is occasionally found an abrupt though slight rise immediately preceding the beginning of the ventricular systole (*b*, Figs. 2 and 5). This is due to a sudden increase in the contents of the ventricle by the contraction of the auricle.

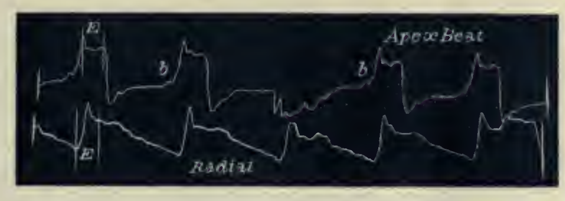

FIG. 5.—Simultaneous tracings of the apex beat and of the radial pulse, showing the "systolic plateau" and the small wave (*b*) due to the auricular systole. The third beat in the apex tracing is obliterated by the movement of inspiration.

SEC. 3. RETRACTION OF YIELDING STRUCTURES IN THE NEIGHBOURHOOD OF THE HEART DURING THE VENTRICULAR SYSTOLE.—When the ventricles expel their contents they must of necessity shrink. This shrinkage occurs abruptly and with considerable force. The yielding tissues in the neighbourhood of the heart are dragged upon, and evidence of this dragging can be got from a variety of sources. John Hunter originated the idea that the systole of the ventricles would have a tendency to produce a vacuum, and thus expedite the flow of the venous blood into the chest. Evidence of this "cardiac aspiration" affecting the lungs has been obtained by a number of observers. The tracings by Delépine of the movements of the column of air in the respiratory passages, due to the cardiac aspiration, correspond exactly with these tracings got from the præcordium (Fig. 6), from under the liver (Figs. 7 and 8), and from the epigastrium (Figs. 9 and 10). The tracing (Fig. 6) demonstrates this drawing in of the tissues in the intercostal spaces over the heart. It was obtained from a boy, æt. 14. The apex beat was well marked in the fourth interspace outside the nipple. At the same time that the apex was thrust outwards the skin and subcutaneous tissues over the same interspace inside the nipple were drawn in. In Fig. 6 the tracings of the apex beat were taken simultaneously with the radial pulse for four beats. The clock-work was then stopped, and the apparatus which had been applied over the apex was placed over the præcordium inside the nipple, and the "inverted cardiogram" of the last portion was obtained. The space (*E*) represents the duration of the outflow from the ventricle; and this period, which in the apex tracing shows a flattened elevation, shows a great depression in that got from the front of the heart. The ascending limb of the apex tracing corresponds to the period during which the ventricle is contracting (Space *D*, Fig. 2). This period in the "inverted cardiogram" is represented by a slight rise, due to the shock of the contracting ventricle. No blood has as yet escaped from the ventricle. As soon as the semilunar valves open, the blood rushes out of the ventricle, the ventricles diminish in size and suck in the yielding tissues of the interspace, and cause the great fall, as represented in the "inverted cardiogram" (Space *E*, Fig. 6).

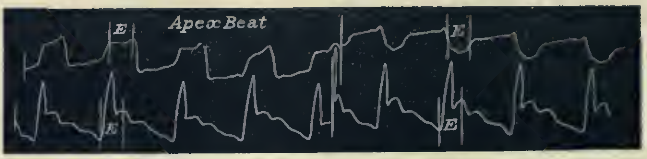

Fig. 6.—Simultaneous tracings of the heart movements (upper tracing) and of the radial pulse. The first part of the upper tracing was taken from the apex beat in the fourth interspace immediately outside the nipple, while the latter part was taken in the same interspace near the left border of the sternum. In the first part the cardiogram shows a "systolic plateau" during the ventricular outflow (*E*), in the other part the cardiogram is inverted, *i.e.*, there is a depression during this period (*E*).

Sec. 4. Liver movement due to cardiac aspiration.—Not only can this aspiration be demonstrated as affecting the pliable tissues immediately in contact with the heart, but in suitable cases it can be shown to produce a distinct excursion of the liver. All writers referring to this movement of the liver speak of it as a downward thrust during the ventricular systole. Careful tracings demonstrate that this movement is quite of the opposite nature—it is a drawing up of the liver during the ventricular systole. In Fig. 7 the apex beat is taken at the same time as the movement of the liver. The apparatus taking the liver movement being applied to the under surface of the organ, a retraction of the liver upwards corresponds with a fall in the tracing, and *vice versâ*. It will be seen that the movement of the liver upwards takes place during the ventricular systole, while the downward movement is due to the diastolic filling of the ventricle. In Fig. 8 the movement of the liver is recorded at the same time as the carotid pulse. It is seen that as soon as the carotid pulse appears, the liver is withdrawn into the chest, and remains there until the end of the ventricular systole, after which the liver gradually falls down into the abdomen. I do not mean that the excursion of the liver is one of considerable extent, but the movement is sufficiently great as to be obvious to the palpating hand. It is distinct from a pulsation of the liver, which is a periodic swelling of the liver.

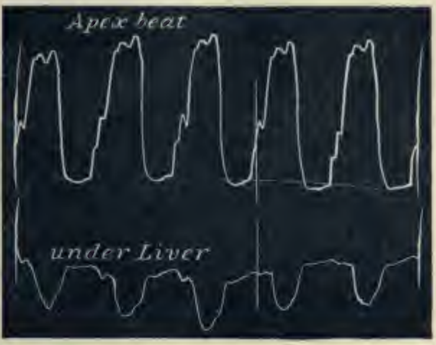

FIG. 7.—Simultaneous tracings of the apex beat and of the movements of the liver, showing a great fall in the liver tracing during the ventricular outflow, the liver then being drawn upwards by the emptying ventricles.

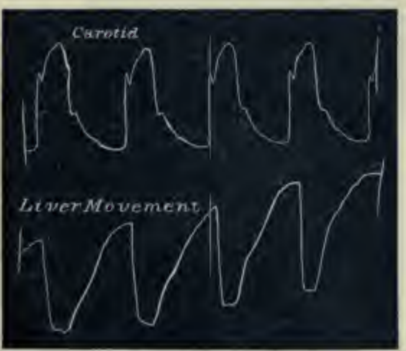

FIG. 8.—Simultaneous tracings of the carotid pulse and of the liver movement, showing that, as soon as the carotid pulse appears, the liver is drawn up by the emptying of the ventricles; and on the cessation of the ventricular outflow, the liver is pushed down by the filling of the ventricles.

SEC. 5. EPIGASTRIC PULSATION DUE TO DILATATION OF THE RIGHT VENTRICLE.— In the later stages of typhoid fever and other exhausting diseases, epigastric pulsation is an ominous sign of cardiac enfeeblement. The movement consists of an alternate swelling and retraction of the epigastrium. It is invariably assumed that this swelling or pulsation is due to the ventricular systole, and to be of the same nature as the outward protrusion constituting the apex beat. If this form of epigastric pulsation is carefully timed with the carotid pulse, it will be found that the epigastric pulse, protrusion, or swelling, precedes the carotid pulse, and that the retraction of the epigastrium corresponds in time to the carotid pulsation. The apex beat is never available in these cases, on account of the right heart pushing the left backwards. In the tracings of the epigastric pulse (Fig. 9), the radial pulse is taken as the standard of time. The time occupied by the pulse travelling from the heart to the wrist being allowed for, it will be found that the great fall in the epigastric pulse corresponds exactly with the ventricular systole (*E*). The patient from whom this tracing was taken was dying from pernicious anæmia. At the post-mortem examination a needle pushed through the epigastrium, at the place where the tracing was obtained, was found to have penetrated the right ventricle. In Fig. 10 a similar tracing is given, except that there is a slight interruption at *c*, on the line of descent. This will be found to correspond exactly to the time of the abdominal aorta, taken from the middle of the abdomen, a few beats of which are also given. This small wave (*c*) is due to the impulse imparted to the tissues by the pulse of the underlying

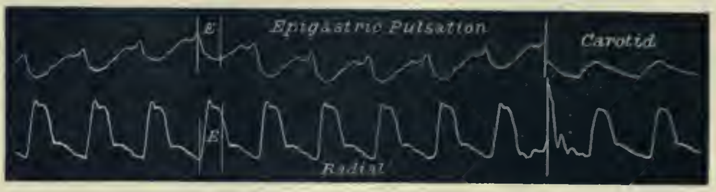

FIG. 9.—Simultaneous tracing of the epigastric pulse, due to a dilated right heart, and of the radial pulse. The epigastric pulse shows a retraction during the ventricular systole (*E*), and a protrusion during the filling of the ventricle.

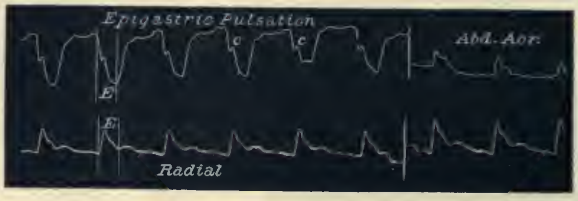

FIG. 10.—Shows the same features as Fig. 9, with the exception of the small wave (*c*) occasioned by the shock communicated to the epigastrium by the abdominal aortic pulse. A few beats of the abdominal aortic are also given.

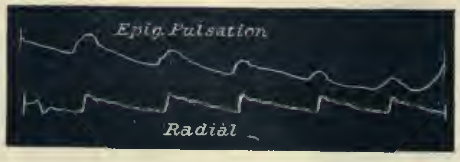

FIG. 11.—Simultaneous tracings of the epigastric pulse, due to the abdominal aorta, and of the radial pulse.

aorta. Epigastric pulsation, due to the abdominal aorta, presents quite a different character from that due to a dilated right ventricle, as shown in Fig. 11, where the pulse corresponds in character and time with the radial pulse. Epigastric pulsation, due to hypertrophied left ventricle, has the same character as an apex beat (Fig. 12).

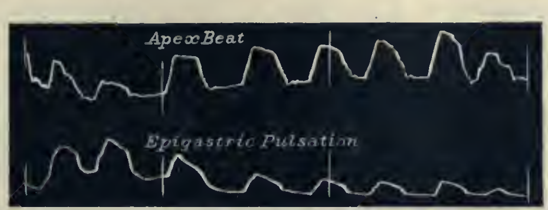

Fig. 12.—Simultaneous tracings of the apex beat and of the epigastric pulsation, due to a hypertrophied left ventricle.

Sec. 6. The apex beat due to the right ventricle.—Accepting the usual clinical definition of the apex beat, "being the lowest and outermost part of the heart's impulse," a totally different form of beat is found when the right ventricle causes this movement. In certain cases of dilatation of the right heart, nearly the whole anterior aspect of the heart is composed of the right auricle and ventricle, the left ventricle forming but a mere strip of the left border. This portion of the left ventricle is situated so far back that it is covered by the lungs and does not reach the chest wall. Hence it is that "the lowest and outermost part of the heart" in contact with the chest wall is the right ventricle. The nature of the apex beat corresponds exactly with those features characteristic of the liver movements of the epigastric pulse, due to enlarged right heart and of the inverted cardiogram in Fig. 6. In place of the outward thrust during the systole, as in the apex beat due to

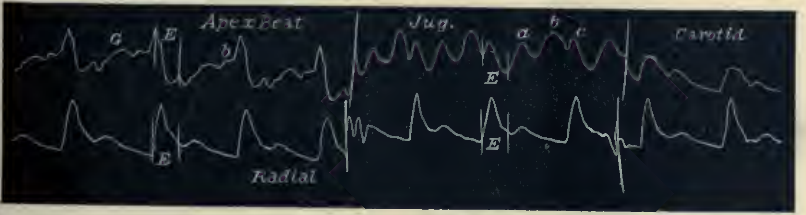

Fig. 13.—Tracings of the apex beat, jugular pulse, and carotid pulse (upper tracing), taken at the same time as the radial. The apex tracing is due to the right ventricle, and shows a depression (*E*) during the ventricular outflow. The sharp elevation preceding *E* is caused by the shock of the contracting ventricles. This is preceded by a small wave (*b*), which is due to the contracting auricle distending the ventricle, and corresponds in time exactly with the wave (*b*) in the jugular pulse, which is due to the contracting auricle sending a wave of blood back into the veins.

the left ventricle, there is an indrawing of the tissues. Fig. 13 was taken from a youth, æt. 18, with simple dilatation of the heart, and free from valvular disease. There was marked pulsation of the jugular veins, a few beats of which are given. The apex tracing shows a great depression during the period of ventricular outflow (*E*). This period is immediately preceded by an abrupt rise due to the shock communicated to the chest by the sudden hardening of the ventricular wall. Although corresponding with the period (*D*), Figs. 2 and 3 in the left ventricular apex tracings, I am inclined to think that the rise here is an instrumental fault, due to the violent shock communicated by the sudden ventricular contraction (see Sec. 6). This period is preceded by a small wave (*b*) in the tracing, identical with the similar rise in Figs. 2 and 5 of the left ventricular apex beat. It is due in this case, as in those, to the distension of the ventricle by the auricular systole. It occupies exactly the same period in the cardiac revolution as the wave (*b*) in the venous pulse, and is produced by the same cause. The space (*E*) in all the tracings represents the period of ventricular outflow as it affects the different pulses. One can, therefore, readily and with certainty refer the different events to their causes. Thus we know that the wave of contraction arising in the auricle passes on to the ventricle, that between the auricular outflow and the ventricular outflow a period (*D*, Fig. 2) exists, during which the ventricle is contracting and raising its pressure until it opens the semilunar valves. Thus the period (*D*) in the apex tracing, exactly corresponds to the period between the appearance in the venous pulse of the wave (*b*), due to the auricular systole, and the wave (*c*) due to the carotid pulse. A few beats of the carotid are given, which can be taken as a standard of time to verify all these points. The period (*G*) in apex tracings of both sorts is due to the filling of the ventricle. One can often demonstrate in individual cases the change of the apex beat, from one characteristic of the left ventricle to one characteristic of the right. Cases of heart failure from mitral stenosis afford the most typical examples. Fig. 14 is a tracing of the apex beat and the radial pulse, taken simultaneously from a patient suffering from mitral stenosis on 2nd March 1893, the apex beat being in the

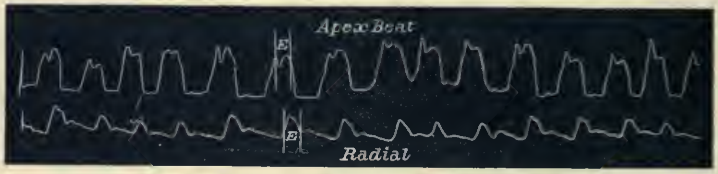

FIG. 14.—Simultaneous tracings of the apex beat and radial pulse from an old-standing case of mitral stenosis. The apex beat is due to the left ventricle, the period of ventricular outflow (*E*) being characterised by a sustained elevation.

sixth interspace. On the 12th of February 1895, the patient was suffering from extreme heart failure, the apex beat being in the seventh interspace (Fig. 15). In Fig 14 it will be noted that the systolic period (*E*) is marked by sustained elevation, characteristic of the apex beat due to the left ventricle. In Fig. 15, on the other hand, the systolic period (*E*) is marked by a great depression. It is asserted in text-books that an indrawing of the apex during systole of the ventricles, is a diagnostic sign of adherent pericardium. I have had several cases where I have got at one time tracings of the apex beat due to the left ventricle, and at other times tracings due to the right ventricle, with indrawing during systole; and at the post-mortem examination there has never been found any signs of adherent pericardium. The patients who usually present this form of apex beat have nearly all suffered from extreme heart failure, as can be inferred from the consideration of the radial pulse in the last two tracings. When this heart failure was recovered from, the tracings showed that the apex beat was due to the left ventricle.

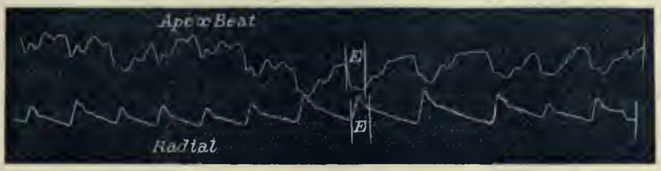

FIG. 15.—Simultaneous tracings of the apex beat and radial pulse, from the same patient as gave Fig. 14, during a period of extreme heart failure. The period of ventricular outflow (*E*) is now characterised by a fall in tracing, and is therefore due to the right ventricle. The pulse is very irregular in rhythm.

SEC. 6. THE SHOCK DUE TO THE VENTRICULAR SYSTOLE.—I am of opinion that a good deal of confusion in regard to the correct interpretation of the heart movements has arisen, from the association of the shock conveyed to the chest wall, when the ventricle passes into systole appearing to occur at the same time as the apex beat. Hence the apex beat and this impulse have become so connected that it is assumed that they are one and the same thing. The apex beat due to the left ventricle is a movement which lasts during the whole of the ventricular systole; the shock caused by the ventricular contraction endures but a short space of time, and occurs while the ventricle muscle suddenly contracts and corresponds with the up-stoke only of the apex beat *D* (Figs. 2 and 3). It is this shock which sends the lever so high in Figs. 5 and 13 at the beginning of the ventricular contraction. In the tracings of the liver movements (Figs. 7 and 8), of the epigastric pulse (Figs. 9 and 10), and of the movement from the front of the heart (Fig. 6), the period of this shock is just before the fall due to the emptying of the ventricle (Space *E*). Thus, in noting the time of the shock and watching the epigastric pulse, for instance, as in Figs. 9 and 10, one could see that the retraction of the epigastrium followed it. If one associated the shock with the apex beat, it would therefore be assumed that the protrusion corresponded with the systole and the retraction with the diastole. I think it necessary to point this out, as I have frequently found observations attributing certain movements as due to the systole of the ventricle, when this systolic shock was taken as the standard of time.

HEMIANOPIA.

By Gustavus Hartridge, F.R.C.S., *Ophthalmic Surgeon and Lecturer on Ophthalmology to the Westminster Hospital; Senior Surgeon to the Royal Westminster Ophthalmic Hospital, etc.*

Hemianopia is always of great interest in relation to intracranial disease, and constitutes one of the most important localising symptoms. The defect is not very frequently met with, though possibly many cases escape detection, for the patient seldom complains of any very definite subjective sensations. It is quite unusual for him to state that he sees only half an object or only to one side of him. Generally the only symptom complained of is defective vision in one or both eyes.

I would briefly recall to the reader's mind the course taken by visual impulses from the eye to the brain. The fibres of each optic nerve extend backward to the chiasma where semi-decussation takes place; so that the right optic tract is made up of fibres from the temporal half of the right retina and the nasal half of the left retina. Each optic tract crosses the under surface of the crus cerebri and becomes lost in the anterior corpus quadrigeminum and the corpus geniculatum, which together form the primary visual centre: from this primary centre the fibres spread out and are distributed to the occipital cortex; so that every object seen on the right produces sensory impressions, which are conveyed through the left optic tract to the left occipital lobe, to become there an object of consciousness.

The three following cases have recently been under my care and present points of interest.

Case 1.—*Homonymous hemianopia.*—A. B., æt. 53, a clerk; attended the Westminster Hospital on 13th July 1897, complaining of defective vision, more marked in the right eye; this commenced about two weeks ago, and since then he has been unable to do his work.

Family history good, as far as can be ascertained.

The man himself has always enjoyed good health till the last six months; since then he has lost flesh and feels disinclined for work.

No history of syphilis, rheumatism, or gout. Was married at the age of 25, and has a family of four children, all living and healthy; his wife has had no miscarriages.

The patient was thin and pale, and had a somewhat anxious expression; there was some loss of power on the left side, and he slightly dragged the left leg when walking; knee-jerks normal; no ankle-clonus.

Inquiry elicited that, in addition to his bad vision, he had lately suffered from persistent frontal headaches, that he slept badly at nights, but often felt drowsy in the day time; memory good.

R.V. $\frac{6}{18}$; not improved with spheres; reads J 2 slowly with + 2 D.

L.V. $\frac{6}{12}$; not improved with spheres; reads J 1 slowly with + 2 D.

Right pupil, 4 mm.; sluggish to light and accommodation.

Left pupil, 3 mm.; also sluggish.

On taking the fields of vision with the perimeter the charts showed loss of the right half of each field, extending up to, but not including, the fixation point. On careful examination with small coloured objects, 4 mm. square, the colour field was found contracted on the left sides.

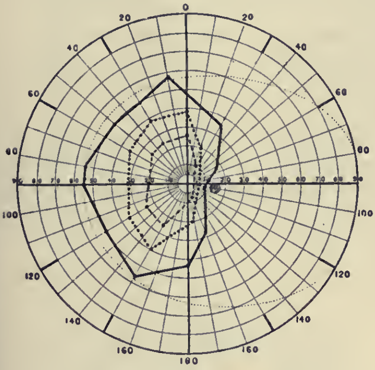

Fig. 1.—Right eye.

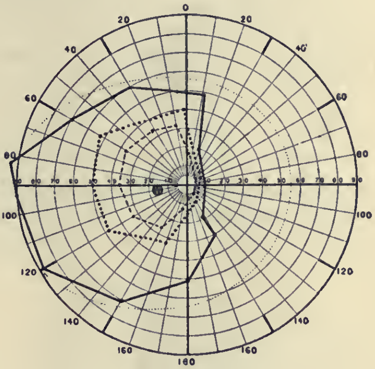

Fig. 2.—Left eye.

——— represents field for white.
……… „ „ „ red.
- - - - - „ „ „ green.

The fields were taken on three separate occasions with practically the same results.

On a further examination of the pupillary actions, by throwing the light on the blind portion of the retina only by means of a concave mirror, the iris still seemed to respond, showing that the lesion of the brain might be looked for further back than the point at which fibres come off to the oculomotor nucleus.

The ophthalmoscope showed nothing abnormal in either eye.

Urine acid, sp. gr. 1022; no albumin or sugar.

The diagnosis arrived at was, that the man had some disease of the right occipital lobe, possibly embolic in character; though it might be that a syphilitic gumma was present in this situation. The patient was put on a course of iodide of potassium, which he took without any apparent effect for several weeks. On 19th September, about two months from the time he was first seen, he had a fit, never regained consciousness, and died in about four hours.

At the post-mortem examination some mischief was found in the apex of both lungs. The external appearances of the brain were normal. In the right occipital lobe was found a large area of softening, into which a recent hæmorrhage had taken place, breaking down the brain tissue extensively, and making its way through into the right lateral ventricle which was full of blood.

The hemianopia was no doubt due to the softening of the brain tissue, but the exact cause is not clear. The intracerebral hæmorrhage was the cause of the patient's death.

Case 2.—*Homonymous hemianopia.*—F. B., æt. 56, a painter, presented himself in October last, complaining that his vision was defective, more especially on the right side; the symptom had appeared suddenly, and the patient could give no explanation of it.

His family history appeared unimportant; he had never been married; had had venereal disease when a young man, but was unable to remember the nature of it, although he does not think it was followed by any secondary troubles. Never had colic or wrist-drop; no line on gums; general health good. Urine, sp. gr. 1018; no albumin; no sugar.

R.V. $\frac{6}{9}$; not improved; reads J 1 well with + 3 D.

L.V. $\frac{6}{12}$; Hm. 50 D $= \frac{6}{12}$; reads J 1 with + 3 D slowly.

Pupils regular and equal, acting fairly to light and accommodation. Movements of eyeballs normal. The visual fields show a marked defect on the temporal side of the right field and the nasal side of the left; also slight concentric contraction of fields, as shown in the following charts.

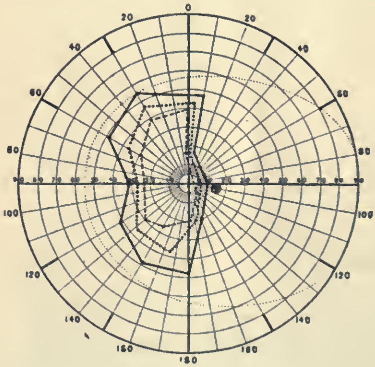

Fig. 3.—Right eye.

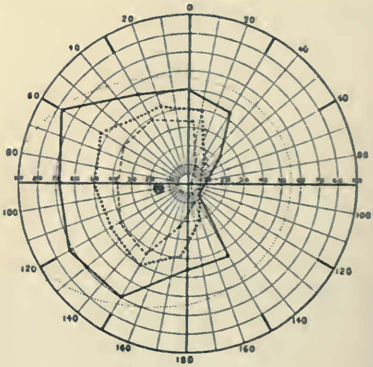

Fig. 4.—Left eye.

——— represents field for white.
………… ,, ,, ,, red.
- - - - - ,, ,, ,, green.

Discs look slightly pale, and in the right eye a few circular patches of disseminated choroiditis were found in the periphery.

No loss of muscular power or anæsthesia; reflexes normal; patient thinks his memory failing somewhat.

On the supposition that a syphilitic gumma may be present on the right side of the brain, he has been put on a course of iodide of potassium, 30 grs. three times a day. At present the man's condition seems about the same as when first seen, certainly no worse.

Case 3.—*Binasal hemianopia.*—H. W., æt. 32, came for advice on 15th August 1897, to the Royal Westminster Ophthalmic Hospital, on account of failure of vision, which was first noticed last July, and was getting gradually worse.

Family history good. The patient himself has never been very robust, but his general health is fairly satisfactory, never having been laid up since childhood; had syphilis some seven or eight years back; this was followed by a rash over the body, and since then he has become rather bald. The patient was under treatment for about six months, and since then has had no further symptom of the disease; no history of rheumatism.

Been married five years and has two healthy children.

R.V. $\frac{6}{12}$; not improved; reads J 1 at 20 cms.

L.V. $\frac{6}{12}$; not improved; reads J 1 at 20 cms.

Pupils regular, about 4 mm. in size, with normal reactions.

With the ophthalmoscope the right disc is swollen, edges blurred, especially the nasal and upper margins; retinal veins full and tortuous; no hæmorrhages or white spots. Left disc—papillitis rather more marked than on the right side, one small flame-shaped hæmorrhage near the upper margin of the disc.

Urine acid, 1021; no albumin; no sugar.

The fields of vision are quite characteristic, showing loss of the nasal side of each retina.

The patient must be suffering from some disease of the sphenoid bone, involving the anterior part of the optic chiasma.

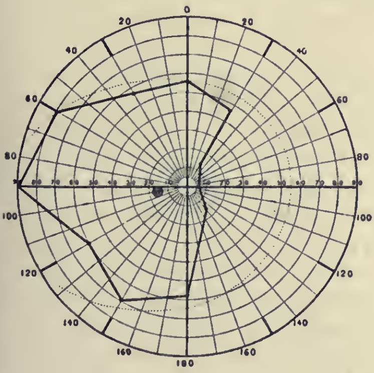

Fig. 5.—Left eye.

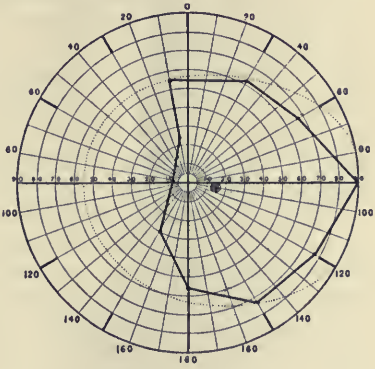

Fig. 6.—Right eye.

——— represents field for white.
.... ,, ,, ,, red.
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He was at once placed on a strong mercurial course, which he is still taking. On 10th November the patient was decidedly thinner; the vision and fields, however, remain the same, and the patient considers himself much better.

The discs are getting pale and their edges are becoming better defined.

ON MOVABLE KIDNEY, WITH SPECIAL REFERENCE TO ITS INFLUENCE ON THE NERVOUS SYSTEM.

By C. W. Suckling, M.D. (Lond.), *Consulting Physician to the Queen's Hospital, Birmingham.*

Ever since I have been in practice I have made it a rule to thoroughly examine each patient who comes to me,—that is, to examine not only the part complained of, but all organs; and in the case of women, I have always insisted on the necessity of the corsets being removed, and of an examination of the abdomen. Through doing this I have come across hundreds of cases of movable kidney. But it is only during the last five years that I have realised the great importance of the subject, and only within the last two years have I found a belt which will in the great majority of cases keep the kidney up. I believe it will not be necessary to perform a surgical operation to fix the kidney if these belts are used. Before I found the belt described later on I had ordered some hundreds of belts varying in pattern, but I found that they almost invariably failed to support the kidney. I do not consider it necessary to recall any observations with reference to the subject of movable kidney, except the excellent article in Sir William Roberts' work on "Urinary and Renal Diseases," almost every word of which I have found to be absolutely correct.

What is meant by movable kidney?—I call a kidney movable which can be grasped by the hand, felt below the ribs, and made to slip up by the hand; the term "dropped" or "dislocated" is even better than the term movable, for the kidney is displaced from its cavity.

How is it that movable kidney is so frequently overlooked?—I believe this arises from a want of knowledge of its frequency, of its importance, and of the proper way to examine for it. Thousands of women are in bad health and unable to perform their duties in life, and suffer from nervous exhaustion, owing to movable kidney. When they seek medical advice, they are often not requested to remove their corsets.

How is it that when movable kidney is found very little importance is attached to it?—I think this is because the symptoms at present are not generally known, and because belts ordered for the condition fail to relieve. The usual procedure is to send the sufferer to the surgical instrument maker to procure a belt, but no examination of the patient, with the belt on, is made to ascertain if the belt supports the kidney or not. The matter is left to the instrument makers, who are quite incompetent to judge of the efficacy of a belt. In the vast majority of cases the belts have failed, and so the subject of movable kidney has been in disrepute. I find that it is impossible for some (few) people to wear a belt at all, but I have had a large number of people very much relieved and cured of their symptoms by wearing it.

Frequency of movable kidney.—I have taken from my private case-book the cases of 100 women and 100 men whom I have seen during the past few weeks. Of the 100 women, forty-two had dropped kidney; and of the 100 men, six had dropped kidney; in many cases both kidneys were dropped. The left kidney, on account of its anatomical relations, is less frequently dropped than the right kidney in women; in men the left kidney is dropped as frequently as the right. The above numbers fairly represent the frequency of movable kidney. I could give several hundreds of cases, if it were necessary.

How to diagnose movable kidney.—The diagnosis can only be made by palpation of the abdomen. The abdomen should be uncovered and the patient should be lying down. To feel the right kidney, the right hand should be placed on the abdomen, the thumb being under the last rib at the back and the fingers in front below the costal margin. The kidney may be felt with slight pressure of the fingers to be down, but if not, when the patient draws a deep breath, the kidney will slip into the fingers and can be slipped back easily. A common mistake is to palpate the abdomen with the flat of the hand, this simply pushes the kidney in front of the hand; the best way is to get the kidney between the thumb and fingers, and not to press too heavily so that the kidney cannot come down. When the patient assumes a sitting or standing position the kidney comes down more than it does during inspiration when lying down, and it is necessary before concluding that the kidney is not movable to examine the patient sitting or standing. In these two positions the patient should lean forward and try to relax the muscles. To illustrate the importance of this, two years ago I sent a woman, who had a movable kidney and was unable to do her work, to a surgeon to be operated upon. The surgeon could not find the kidney when she was put under an anæsthetic; he sent for me the following day to examine the patient again. I could not find the kidney while she was lying on her back, but when I asked her to sit up the kidney could at once be felt in the right iliac fossa. In examining the left kidney the left arm should be placed round the body, the physician standing on the right side of the patient, the fingers being placed under the last rib, the right hand should be placed under the left costal margin; on drawing the breath or on sitting or standing, if the kidney be movable, it will be felt between the fingers and can be made to slip up in a most characteristic way. The left kidney rarely falls to the same degree as the right. I have never met with it falling below the umbilicus, while the right kidney frequently falls into the iliac fossa and even into the pelvis. It is remarkable that the left kidney feels much smaller than the right.

Subjective symptoms of movable kidney.—*Pain.*—Movable kidney either single or double may be present without any symptoms. But in the majority of cases there is marked ill-health. In the case of the right kidney there is rarely pain, but often on walking, or standing, or sitting there is an uneasy feeling in the back on the right side. In the case of the left kidney, pain is the most prominent symptom and is very severe; the pain disappears when the patient is lying down and comes on whenever she sits, stands, or walks. The pain then is under the left costal margin, running round the left side. I have had at least a dozen cases where this pain had been present for a long time, and was removed immediately by the use of the belt. A young lady recently came to me complaining of pain of this description from which she had suffered for two years. I suspected that the left kidney was a little dropped although I could not feel it. The belt at once cured her.

Mental depression and hypochondriasis.—In some cases depression of mind occurs and hypochondriasis. A lady who was under my care for mental depression and hypochondriasis, and had been ill for some years, had a movable right kidney; when this was stitched up she recovered at once.

Inability to walk.—A frequent symptom of movable kidney on either side is inability to walk, the patient being easily tired, and also unable to stand or even to sit up for long, and many people are unable to get about or do any work unless the kidneys are properly supported.

Disturbance of the liver.—Movable right kidney may disturb the liver, it may cause aching under the right shoulder, tenderness of the liver, the presence of bile in the urine, and it may cause attacks just like those of gall-stones. A lady had been ill for some years with attacks of acute pain in the region of the gall-bladder, followed by the presence of bile in the urine; she was greatly depressed and suffered severely. The gall-bladder was opened but no gall-stones found, she still had attacks, when the right kidney was found to be dropped. This was stitched up and the patient was quite cured; she had been considered a confirmed invalid and hypochondriac.

Disturbance of the heart.—Palpitation and pain at the heart may be caused by movable kidney.

Disorder in walking.—This has been mentioned, but occasionally ataxia is present, and sometimes a morbid fear of crossing a street or of walking alone.

Vertigo.—Vertigo may be caused by movable kidney. I saw, a little time ago, a gentleman who had suffered from giddiness for six months. The giddiness had been attributed to dyspepsia, but no medicines had relieved him. I found that his left kidney was considerably dropped, probably due to the fact that he had strained himself in bowling at cricket. I ordered him a belt, the pad to press under the left costal margin, and he was immediately cured, and has remained well ever since. I have met with two or three cases of giddiness caused by movable left kidney.

Enlarged spleen.—In many cases where the left kidney is movable the lower border of the spleen can be distinctly felt, and the organ is tender.

Dyspepsia.—Dyspepsia is often caused by movable kidney.

Albuminuria.—When the kidneys are movable, a trace of albumin is usually present in the urine.

Attacks of *diarrhœa* and *constipation* may be caused by movable kidney.

Exhaustion.—This is a common symptom of movable kidney. Women complaining of being easily tired and exhausted should always be examined for movable kidney; the dragging of the kidneys causing them to be always tired except when lying down. This tired feeling and exhaustion are immediately removed by the use of the belt.

Standing.—Difficulty in standing upright. People with movable kidney, causing them pain or exhaustion if they stand upright, often stoop.

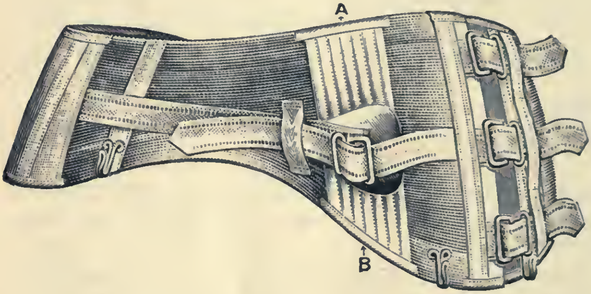
Epilepsy.—I have not had sufficient cases to judge of the effects of movable kidney in epilepsy. I have one case where the patient is greatly improved by the use of the belt, both her kidneys being movable. Since the use of the belt the fits have disappeared.

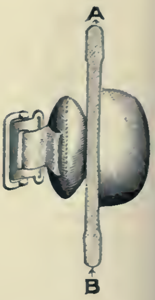
Colic.—In some cases severe attacks of abdominal pain may be caused by movable kidney. The following case is instructive. A lady, always delicate, had been unable to walk properly some years, that is, she was fatigued very easily. For some months violent attacks of colic came on at each period, each attack so severe that it seemed likely to prove fatal; they were accompanied by faintness and vomiting, which lasted nearly twelve hours. Every precaution was taken in the way of rest and other treatment without avail. It was found the right kidney was dropped in the right iliac fossa; the kidney being kept in place by a belt, no further attack occurred. Moreover, the patient was able to walk about and to stand in church, which she had not been able to do for several years, and she says now she would not part with the belt on any account.

Causes of movable kidney.—How is it that movable kidney is present in about 40 or 50 per cent. of women and in only 6 per cent. of men? This must be due to the wearing of corsets. Tight lacing will readily displace the kidney. A fall or strain will displace it. I have found that attendants at refreshment bars who have to draw beer frequently have movable left kidney. I have also found that movable kidney is extremely common in those who suffer from migraine. This may be due to the vomiting and retching which often occur in this complaint.

Lifting weights will cause dropped kidney, and any sudden exertion may do it. Tall people are very liable to it.

Treatment of movable kidney.—I have found it quite useless to attempt to restore a kidney to its position by any tonics, or by any process of flattening a patient, or by rest. For two or three years I tried various kinds of abdominal belts, but after a time I found that they were useless, and did not in any way relieve as I have stated. Two years ago a young man came to me with marked dropped right kidney, which entirely prevented him from following his employment. I ordered a belt for him, which I found did not keep the kidney up. I had several interviews with the makers about it, and, realising that a mere pad on the inside of a belt could not possibly support a dropped kidney, I suggested some pressure should be made outside the belt over the situation of the pad. Messrs. Salt accordingly placed a strap which enabled the pad to be driven in, and the kidney was kept up. This young man periodically goes for a new pad, and is unable to work without the belt. It is this direct pressure on the pad which makes the belt efficient in the great majority of cases. In all cases great care should be exercised, and it should be seen that the air pads do not press upon the ribs. The belt should be put on lying down, when the kidneys usually drop into place; if the kidneys do not go back on lying down, the patient should be instructed to press the abdomen gently upwards with her hand before putting on the belt. It should also be fastened when lying down. The belt not only removes the symptoms of movable kidney, but in some cases, especially in the case of the left kidney, it cures the condition. I have often found that after the use of the belt for a few months the kidney cannot be felt.





In many cases, though the kidney has not been kept up by the belt, great relief has been experienced. I consider that surgical interference will rarely, if ever, be necessary if this belt be used.

THE CLINICAL ASPECTS OF ARTERIAL PRESSURE: SOME PHYSIOLOGICAL DATA BEARING ON THE CLINICAL OBSERVATION OF THE BLOOD PRESSURE.

By George Oliver, M.D., F.R.C.P.Lond.

(Continued from page 132.)

II. Physiological Causes of Variation in the Blood Pressure (Arterial and Venous).

3. *Muscular exercise.*—It has been shown in the course of this inquiry that change of posture affects the blood pressure through the agency of muscular contraction rather than through that of mere alteration of position. This initial effect of muscular action is but the prelude of the more pronounced influence which exercise exerts on the circulation.

There is one fact common to all forms of muscular exertion, which is obvious enough to the most superficial observer, namely, the stimulating effect of physical exercise on the circulatory organs, and the consequent acceleration of the blood flow. And this fact is endorsed by the instrumental measurement of the blood pressures (arterial and venous). Observation shows conclusively that this stimulation affects both extremities of the circulatory apparatus—the central and peripheral; inciting the ventricle to more frequent and more forcible contraction, and the arterioles to dilatation. Consequently a larger volume of blood per unit of time is propelled through every part of the circulatory tubing, and the blood pressure is raised on both sides of the circulation.

The ventricle contracts with greatly increased energy.—This fact is shown by the invariable rise, induced by exercise, in the maximum arterial pressure; in other words, by the much greater external pressure then required in order to arrest the pulsations, than during the intervals of repose. For example, obliterating pressures of from 160 to 180 mm. Hg before moderate active muscular exercise of all kinds will at once rise to such higher readings as from 200 to 230 or 240 mm. Hg; and when the exercise becomes somewhat strenuous (as in cycling up hill) the maximum arterial pressure may even reach 280 or 300 mm. Hg. All observation shows that the strain of exercise is thrown on the left ventricle, and this fact agrees perfectly with clinical experience, which has taught us the golden rule, to adjust the amount of exercise to the physiological capacity of the ventricle.

The peripheral vessels are dilated and contain an increased charge of blood.—This fact, which is supported by experimentation in animals, is shown in man by observation directed to the volume of the limbs and to the venous pressure. I have elsewhere demonstrated, by a simple method of hydrostatic displacement, that the volume of a limb is considerably increased by muscular exercise of all kinds[1]—the swelling being due to the accession of blood to the muscular and other tissues. The venous pressure rises, and the increase of it, which is often very considerable, of course implies that there is a more open condition of the vessels intervening between the veins and the arteries. For example, a venous pressure of 15 or 20 mm. Hg may mount to 25, 30, or even 40 mm.; and when low for the sitting posture (*e.g.* 10 mm.), it is not infrequently doubled, or is more than doubled.

The mean arterial pressure is raised as a rule.—Leonard Hill has recently shown that exercise augments the mean arterial pressure.[2] My observations likewise support this conclusion. I have, however, found that, though exercise as a rule produces this effect, it is not so invariable as the stimulation of the ventricle or the opening up of the peripheral circulation; for every now and then I have observed that the mean pressure remains without appreciable alteration, or actually falls even though there is no suspicion of fatigue; and, moreover, after a certain amount of exercise—the amount apparently varying with different individuals—there arrives a stage in which the mean arterial pressure declines. The mean pressure is but the resultant of the action of the pump on the one hand, and of the terminal resistance on the other; so that it is not improbable that different proportions of the centric and of the peripheral effects of exercise may induce some variability in regard to the rise of the mean pressure, or may prevent that rise, or may even determine a fall. In exercise the usual rise in the mean pressure is mainly due to cardiac stimulation rather than to increased peripheral resistance; and in order to ensure it, it is obvious there must, as a rule, be an enormous increase of ventricular action, so as to more than compensate for the lowering influence of the open periphery. It is conceivable that the balance of rise in the mean pressure may be prevented, or may even be converted into a deficit by a slackening of the cardiac action, or by an excessive dilatation of the peripheral vessels, or by a combination of these conditions. It has seemed to me that the exceptional effect of exercise on the mean pressure—when it fails to be raised or is lowered[3]—is most apt to be produced in individuals in whom it is already somewhat high, and in whom the venous pressure is relatively low; in fact, in those in whom peripheral resistance is increased. Should this position be confirmed by further observation, it is certainly suggestive of the value and usefulness of systematic and regulated exercise in the treatment of those cases in which the mean arterial pressure is raised by contraction, or by passive shrinking of the peripheral vessels.

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[1] See The Croonian Lectures, *Lancet*, London, 1896, vol. i.; and *Journ. Clim. and Bal. Soc.*, London, 1898.

[2] *Lancet*, London, 1898, vol. i.

[3] In all instances of this kind the venous pressure was markedly raised.

Therefore the results of observation of the effects of exercise on the blood pressures, in different individuals, show that they are by no means uniform in all; that, though as a rule the arterial blood pressure is raised, in some the rise is much more decided than in others; that occasionally the rise is not apparent at all, or is trivial; and that now and then the arterial pressure falls. In all cases, however, the venous pressure is raised.

The essential physiological effects of exercise on the circulation are therefore—

(*a*) Stimulation of the heart.

(*b*) Dilatation of the peripheral vessels.

(*c*) Acceleration of the blood flow (the velocity of the flow increasing in proportion to the reduction of the resistance in the peripheral vessels by dilatation).

(*d*) Rise of the blood pressures (arterial and venous) mainly from cardiac excitation. When, in exceptional cases, the arterial pressure falls, the venous pressure rises in a more pronounced degree than usual.

The effects of exercise quickly subside.—With complete repose after exercise it is remarkable how quickly the rise of the arterial and venous pressures settles down. I have often observed that, with due regard to rest, the adjustment of pressure is completed in from five to fifteen minutes; and that the blood pressures are restored long before the rise in the frequency of the pulse has subsided.[1] After all it is perhaps not so surprising that this should be so; for during repose after exercise the peripheral vessels are left dilated—a condition that must favour the rapid subsidence of the mean arterial pressure, the excessive charge of arterial blood quickly draining away through the more open arterioles and capillaries, and the energetic contraction of the ventricle incited by exercise rapidly vanishes. When the heart and the periphery are normal, the adjustment for rest after exercise is undoubtedly rapid; but when there exist departures from the normal condition it becomes less responsive. It therefore follows that in the clinical field care should be taken to ensure a sufficiency of rest after active exercise, before making observation of the blood pressures. But even then, after moderate or gentle exercise, the repose of a few minutes is as a rule all that is necessary for this purpose.

The after-effects of exercise on the blood pressures.—Reasoning on the pendulum principle of stimulation and recoil I have sometimes suspected that exercise may be followed by a reduction of the blood pressures—that the pressures may settle after an interval of rest to a point lower than that which existed before exercise was attempted; and this surmise has doubtless been entertained by others. I have devoted a good deal of observation to the after-effects of exercise, with a view of settling this moot point; but so far I have failed to obtain corroborative evidence in favour of the suspected fall. The pressure merely subsides as a rule to the level normal to the individual in a state of rest; and I have never been able to satisfy myself that a lower point is actually reached. I have already stated that in certain cases the mean arterial pressure is lowered during exercise, especially when it is already somewhat too high. In such cases it has been observed that the arterial pressure is apt to rise again gradually after the cessation of the exercise; and that the venous pressure, which was raised during the exercise, will then fall.[1] These facts appear to show that in such instances exercise is mainly instrumental in opening up the peripheral part of the circulation, and that during the period of repose which follows it the calibre of the peripheral vessels again diminishes.

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[1] Leonard Hill likewise observed this fact. See *Lancet*, London, 1898, vol. i.

Massage.—I have been struck with the singularly small and somewhat variable effect produced by massage on the blood pressure, in the arteries and veins of normal subjects. Local massage does not induce any obvious change in the blood pressure. This fact is, however, not surprising; for the general blood pressure in the arteries and veins must at once assert itself over any comparatively small and local disturbance. But the effect of general massage may be equally negative. I have, however, observed a slight rise (*e.g.* 10 mm. Hg) in the arterial pressures (mean and maximum), and a doubling of the venous pressure; and this observation probably expresses the general drift of the influence of general massage on the circulation in normal subjects. It would, therefore, seem that massage produces effects similar to those of gentle exercise.

Resistive exercises, like all other forms of muscular exercise, bring into the peripheral part of the circulation a large accession of blood. This fact is proved by a considerable increase in the volume of the limbs which they produce—an increase which is demonstrated by the simple method of fluid displacement, which I have elsewhere described.[2] The other effects of moderate exercise on the blood pressure are likewise apparent.

4. *Mental exercise—Emotional excitement.*—The blood pressures may be almost as powerfully affected by activity of the nerve-centres, as by muscular exercise. They are at once raised by mental occupation, and still more particularly by any form of emotional excitement. As in the case of muscular action, this result is produced chiefly by stimulation of the heart—the mean

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[1] The subjects here referred to are probably not "normal" in the strict sense of the term; nor are they apparently quite pathological. They seem to belong to the borderland between the physiological and the pathological, from which they may drift into the latter.

[2] The Croonian Lectures, 1896, *op. cit.*

arterial and the venous pressures being sent up by the more energetic and more frequent contraction of the ventricle.

The rise of the blood pressure due to emotional causes, not unfrequently reaches the higher readings observed in disease; it is, therefore, necessary that the observer should be always well on his guard, so as to eliminate as much as possible this source of error. The experienced physician is always alive to it in his ordinary digital examination of the pulse; and observation and tact have taught him how best to elude it. The perturbation of the circulation due to emotion is quite a passing affair, as a rule; and in all cases, while it lasts, the high maximum arterial pressure, the increased venous pressure,[1] the frequent pulse, and the obviously excited action of the heart, are sufficient warnings to indicate that the time has not yet arrived for the making of a trustworthy observation. I am satisfied that with ordinary care the observation of the blood pressures is not materially vitiated by emotional causes.

5. *Fatigue — Loss of vasomotor adjustment.* — The study of fatigue is of special interest to the physician, because the physiological features of it verge on the pathological, and in many ailments they form the prominent and essential features. The expression of it in the circulation is read in the diminished activity of the muscular tissue, which controls the distribution of the blood, and determines the arterial and venous pressures—whether that tissue be located in the ventricle or in the peripheral vessels. When the force of ventricular contraction slackens, the arterial pressure diminishes; and when the arteriolar tone wanes, contraction gives place to relaxation, and the venous pressure rises relatively to the arterial. This stage of fatigue is merely evanescent, and is of course consistent with the highest health. But even within the limits of health, temporary functional exhaustion may go further than this; for it may, though rarely, for a time invade the nerve-centres which regulate the contractility of the peripheral vessels. A more profound disturbance of the circulation is brought about. In a word, the mechanism which ordinarily renders the circulation proof to the effects of gravity is impaired; so that when the body assumes the vertical position, the blood, no longer distributed independently of that force, now drains into the capacious venous system of the abdomen, and into the veins of the lower half of the body, where it remains for a time withdrawn from circulation.[2]

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[1] I have, however, occasionally observed that the venous pressure is not raised, or is even lowered during nervous perturbation. Then probably the arterioles are contracted by it.

[2] Leonard Hill and Harold Barnard have shown, that when the resistance (or vasomotor tone) in the splanchnic area is high or intact, the circulation will continue through the head, while an animal is placed in the vertical feet-down posture; but should the resistance be reduced to a minimum (as by section of the spinal cord at the level of the first dorsal vertebra), the hydrostatic pressure will distend the

In this condition of temporary vasomotor inadequacy, the blood pressures of the arteries and veins of the upper portion of the erect body fall; but when the horizontal is substituted for the vertical position these pressures at once rise, because the downward drain soon ceases, and gravity no longer actuates the distribution of the blood. This complete reversal of the normal postural alteration of the blood pressures in the upper half of the body is simply the mechanical effect of gravity, induced by the impairment or the withdrawal of vasomotor tone. This transitory loss of control over gravity is, however, but rarely observed in its complete form in health. It more frequently happens that fatigue merely abolishes the postural variation of the arterial and venous pressures—the usual fall produced by the prone posture failing to become apparent, because of some impairment of vasomotor tone. Diminution of vascular tonicity, as the result of fatigue, is likewise shown by the temporary hydrostatic effect produced by change of posture—the blood pressure rising, but only for a few minutes, when recumbency is assumed, and then rapidly settling to a lower level than obtains in the erect position of the body. This oscillation of the blood pressure, as the result of change of posture, is not observed when the vasomotor tone is not impaired.

6. *Rest.*—As might be expected, rest—mental as well as physical—has a marked influence in lowering the blood pressures (arterial and venous). This result is mainly due to a reduction in the force and frequency of the heart's action. In proportion to this reduction the maximum and mean arterial pressures are lowered; but, of the two, the former falls more than the latter. The peripheral vessels probably shrink, from diminution of the distensile pressure of the ventricle, and consequently the fall of the venous pressure is still more pronounced than that of the arterial pressures. Rest, therefore, specially conduces to the easing of the work of the pump, and must therefore favour the restoration of tone to the cardiac muscle and to the vasomotor mechanism.

I have not made any observations on the effects of sleep on the blood pressure. Leonard Hill has, however, recently done so, and has shown that the arterial blood pressure does not fall lower during sleep than in ordinary rest, and consequently he infers that the anæmic theory of sleep is untenable.[1] It is, I think, not improbable, that with the reduced activity of the circulatory forces, which obtains in sleep as in ordinary rest, there is a general shrinking of the arterial side of the circulation, and that the blood which fails to be distributed to the arteries collects on the venous side. If this be so, the reserve capacity of the

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splanchnic area to such an extent, that the whole blood collects within the capacious venous reservoirs of the abdomen, and the current through the high resistance circuit (the head) ceases (*Journ. Physiol.*, Cambridge and London, vol. xxi. p. 324).

[1] *Lancet*, London, 1898, vol. i.

veins may therefore be made available during periods of rest and sleep, as well as during those of exercise; in the former, the blood overflowing in all probability into the capacious splanchnic veins, and in the latter into the systemic veins. Anæmia of the brain in sleep may thus be favoured; hence the earlier observations which suggested cerebral anæmia as the cause of sleep. The anæmia is, however, but the result of reduced activity of the arterial circulation and should not be regarded as the cause of sleep. It is probably a most important, if not a necessary, condition of sleep; and, so far as my observations of the arterial pressure in relation to insomnia go, I am disposed to think that clinical experience supports this view.

(*To be continued.*)

FUNCTIONAL IRREGULARITY OF THE HEART'S ACTION.

By J. Stitt-Thomson, M.D., F.R.C.P.Ed., F.R.C.S.Ed., *Lincoln.*

"There is, perhaps, no branch of medicine in which, notwithstanding much knowledge, the confidence of the practitioner is so easily shaken, and in which he is so apt to relinquish the courage of his opinions, as in heart disease." These are the opening words of a lecture delivered quite recently by Sir Douglas Powell.

"There is perhaps no single symptom connected with the heart which gives rise to so much discomfort, uneasiness, and feeling of insecurity, as intermittency or irregularity of the pulse." These are the words of so high an authority as Dr. George W. Balfour.

The sentences are pregnant with truth, and they form an excuse for my bringing before you this subject at this time. Every practitioner knows how anxiously advice is sought in cases where the heart has made itself evident, and those who have had any experience in such cases know how important it is to come to a definite conclusion.

Functional disorders of the heart are very numerous and arise from many causes. Generally they are originated by morbid conditions of the blood, or it may be from a degenerate condition of the nervous system. Many and various symptoms arise. We have the hurried heart's action—the tachycardia—accompanying the exophthalmic goitre. We in Lincoln are only too conversant with this condition, where the enlarged thyroid, with or without the prominent eyeballs, is all too common. We have the opposite condition—bradycardia—found so often with myxœdema, or after influenza. We have the palpitation of hysteria, arising no doubt from some unknown irritation of the vagus or cardiac plexus. We have, most commonly of all, the irregular cardiac beat of the anæmic girl—the hydræmic condition of the blood being responsible very frequently for the irregularity. All these cases are so common and their treatment so well known that I will pass them over.

Some most interesting cases, however, of functional irregularity of the heart have come under my notice within the last few years, and I will shortly draw your attention to three of these, as examples of true functional cardiac disorder, all more or less cured by treatment. Functional cardiac disorders have been described as neuroses. Irregularities, arising from causes operating at a distance from the heart, are described as neurotic, in contradistinction to the nervous disturbance due to local disease.

I do not like the words "functional" or "neurotic"—they are non-scientific terms, and are, I am afraid, often used to screen our own ignorance. But for clinical purposes they answer well enough, and our present knowledge of the exact causes of the so-called functional disorders of the heart is so limited that no more definite terms can be applied.

To enter into the minute anatomy of the heart nerve supply would, of course, be out of place here, but it is nevertheless to the nerve distribution that we must look for the vagaries and wanderings of what ought to be a steady-going cardiac organ.

Balfour states that "the nervous system neither initiates nor maintains the rhythmic movements of the heart, but it controls and regulates them, and through it those movements may be variously modified or even arrested." It is almost certain that for purely functional irregularity we must look to one of the cardiac nerve supplies.

Now we know that the nerve cord which passes through the first dorsal and the last cervical ganglion into the sympathetic nerve conveys those impulses which increase the rate of pulsation (Balfour). This is the great katabolic nerve of the heart. The inferior cardiac nerve—the second of the cords connecting the heart with the central nervous system is, according to Balfour, the great anabolic nerve of the heart, and its action is to inhibit the action of the augmentor or katabolic nerve. The third nerve cord is the superior cardiac nerve. The same authority states that this conveys from the heart to the vasomotor centre in the medulla oblongata an influence which enables it to regulate and control the movements of the arterioles, in accordance with the needs of the heart. This nerve is often called the depressor of the heart.

Now the superior and inferior nerves enter the trunk of the vagus and ascend to the brain; thus you will see that the superior controls the blood pressure through the vasomotor centre in the medulla. The inferior, anabolic or vagus nerve, counteracts and inhibits the action of the katabolic nerve, slows the heart, and lessens the excitability of the ventricles. The katabolic or first cord, though it does not *cause* cardiac movements, hastens it and is kept under control by the anabolic nerve, and is closely connected with the sympathetic system.

It is obvious that anything which disturbs what might be called the natural harmony of these nerves must upset the normal rhythm of the heart beat. Reflex stimulation, arising possibly from irritation in the stomach or bowel, of the cardio-inhibitory centre, will cause undue slowness, and this effect is most marked in the auricles; irregularity is caused by the auricles failing to respond to contractile impulses.

It is now tolerably certain that all irregularity of a functional character is due to vagus inhibition. Irregularity in itself may not be dangerous, but it is so usually accompanied by dilatation that it constitutes a danger, and as years increase in number so this danger increases in volume.

Intermittence usually points to a feeble myocardium. The very irregularity indicates that the ventricle is not thoroughly emptied with each beat. Hence dilatation follows in its train, and whilst in the young there may be, and generally is, compensation by hypertrophy, in those beyond middle life the walls begin to thin, valves to break down, and general cardiac failure gradually appears.

Functional errors of the cardiac ganglia and of the vagus are responsible for palpitation and irregularity of action, and to find out the nature of the error is the task of the physician, and to treat each case on its own merits is his aim and object.

The following three cases illustrate in a marked degree functional irregularity:—

Case 1.—A gentleman æt. 44, with a distinctly nervous habit, living a life of comparative ease and luxury, was, without any apparent cause, seized with a most irregular and distressing cardiac action. The organ was, so far as any examination could reveal, absolutely sound. The distress was very marked and the præcordial anxiety very evident. This patient was under my care for some weeks and then left for another part of the country. He somewhat improved, but a sudden attack of bradycardia, the pulse dropping to about 30, caused the local medical attendant natural alarm, and I was asked to see the case. On arrival the symptoms had improved, but the pulse was still under 40 and intermitting. There was dyspnœa on the slightest exertion, the extremities were with difficulty kept warm; that the circulation was seriously disturbed was evident. Knowing the past history of the case, I, with confidence, assured the patient of an ultimate complete recovery to health. He rallied from the urgent symptoms in a few days, but the irregular pulse remained. He consulted, with me, several eminent medical men, and the various opinions expressed were more interesting than useful. Rest and a quiet life were recommended generally.

Although there was no history of gout it appeared to me that a gouty condition, particularly a "gouty dyspepsia," could account for the symptoms, and treatment on those lines was carefully carried out for many months. Exercise was strongly insisted upon, although the patient dreaded walking upstairs or climbing the slightest hill. Horseback exercise, of which he was very fond, was indulged in moderately, and all dyspeptic symptoms treated by the usual remedies.

After eighteen months of practically a life of misery the heart righted itself, and the health of the patient to-day is very good. When I tell you that he has hunted five days a week all last season, you will understand that there is not much cardiac mischief remaining.

Case 2.—A clergyman, æt. between 50 and 60, has for some years complained of gout, and has had several "attacks" of this disease.

He consulted me some months ago, on account of what were apparently seizures of "tremor cordis," which came on suddenly at night, wakening him out of sleep. The symptoms were well described, and the cardiac anxiety and feeling of suffocation and impending death were evident.

On examination, the gouty diathesis was clearly present. The heart was apparently quite sound, and the blood vessels were not markedly rigid or tortuous, but the pulse was irregular. The patient was very anxious about his condition, and wished to know if he was likely to die in one of the attacks.

This was clearly a case of "gouty heart," and a visit to one of our spas has completely removed all the distressing symptoms. Exercise I have insisted upon, and as the patient is an ardent golfer there is no difficulty here. I have assured him that there is no immediate danger to life.

Case 3.—This is a very remarkable case of irregularity of the heart's action, and is one of the most interesting it has ever been my lot to treat.

A young married lady has, since her childhood, had an irregular pulse. That is her own statement, and for the past three years I can testify to persistent irregularity of the heart's action. I have never found this patient with a regular pulse. During a pregnancy it certainly steadied wonderfully, but after the confinement the palpitation and irregularity were worse than ever.

She is naturally healthy and active, but admits that hill-climbing makes her very breathless. She can, however, play tennis, and is, in fact, a very active young lady.

About six months ago her condition caused me some anxiety. She became anæmic and breathless on the slightest exertion, and symptoms of backward pressure began to show themselves.

She recovered under treatment from these urgent symptoms, and is at present in remarkably good health.

Examination of the heart reveals nothing beyond a thumping "regularly irregular" organ. The irregularity has no regularity about it. It may miss a beat every five or ten seconds, but just as often misses every twenty seconds. It sometimes hurries on in a "fluttering" manner, and will then suddenly slow down—steady for a few minutes, and then begin its vagaries again.

This goes on during sleep as when waking, and yet this patient enjoys life and can get about like other people.

There is nothing to account for this condition; no gout and no gouty history, no special anæmia or hydræmia, no enlarged thyroid. I conclude that this is a pure neuroses, and that some irritation of the nerve supply is present, but there my conclusions cease.

So far, I have purposely avoided the subject of special treatment, as I wish to draw attention to this subject in these, the closing remarks. For functional irregularity most drugs have been tried, but only four seem really to do any good, and in my experience one answers much better than any of the others.

Digitalis, strophanthus, strychnine, cactus.—These four drugs are pre-eminent in the treatment of all cardiac diseases. Now if we admit that functional disease of the heart is due to a neurosis, we would naturally turn to some drug which would act directly, more or less, upon the nerve-centres.

Digitalis, as we all know, acts directly upon the cardiac muscle; the first action is to slow the beat, to prolong the diastole, and to greatly increase the force of the systole. Hence the great value of this drug in a weakened myocardium and organic mischief. No doubt digitalis stimulates the medullary and spinal motor centres also, but not to any marked extent. Another objection to this drug is that, whilst functional irregularity is often due to indigestion, digitalis frequently causes dyspepsia.

Strophanthus acts on the heart exactly like digitalis, but does not appear to have any direct effect upon the nervous system.

Strychnine more nearly approaches our idea of a suitable drug for cases such as are under our notice. Direct excitation of the medullary vasomotor centre is the property of strychnine; this property it is that raises strychnine to a valuable cardiac remedy.

Cactus grandiflorus (*night-blooming cereus*).—This drug has in my hands proved of very great benefit in cases of purely functional cardiac disorders. All the foregoing cases, and many others, have been treated by it, and in every case benefit seems to be derived from the continued use of cactus. The accurate therapeutic history of this drug has yet to be written. It appears to be a cardiac tonic of no mean order, free from cumulative or narcotic action, and it is a slight diuretic. It does not produce any material constriction of the arterioles. It would appear to act more directly than other drugs mentioned, upon the medullary, vasomotor, and cardiac centres—2 to 5 minims of the liquid extract of the cactus grandiflorus, given three times a day, or 2 to 10 minims of the tincture. This dose can be increased to 30 minims. A useful form in which to give this drug is in "cactina pillets." Each pillet contains the $\frac{1}{100}$ gr. of cactina, the active principle of *Cactus Mexicans.*

MIGRAINE AND THE VASOMOTOR THEORY.

By Henry Handford, M.D., M.R.C.P. (Lond.), *Physician to the General Hospital, Nottingham.*

In bringing before you the subject of migraine a second time in one session[1] my excuse is twofold—(1) That the disease—if it can be called a disease—is one of peculiar difficulty and interest; and (2) that there is so much to be said that I can only go over part of the subject. I propose therefore, as far as possible, to avoid that aspect of the question, which has already been so well treated by another of your members.

The limitations of time are imperative; and, even at the risk of making my paper ill-balanced and appearing to attach undue importance to secondary matters, I must omit many things entirely, and confine myself chiefly to my own views, and to the description of a few phenomena which appear to me to have attracted little or no attention. And this is the more remarkable, for, as Gowers says, the disease is often associated with high intellectual ability, and many distinguished scientific men have suffered from it, and have supplied more careful observations of the subjective symptoms than we possess of any other malady. Among the sufferers may be mentioned the celebrated Dr. Fothergill, Marmontel, Haller, Wollaston, du Bois-Reymond, Sir Charles Wheatstone, Sir John Herschell, Sir George Airy, his son Dr. Hubert Airy, and our present President of the Royal College of Physicians, Sir Samuel Wilks. From this you may gather that, however painful and temporarily disabling migraine may be, it is not incompatible with a long life and a vast amount of work of the very highest quality.

Migraine is strongly hereditary. Usually paroxysmal headache will be found to have occurred in an ancestor or some member of the family. Frequently only a general neurosis is inherited, one member of the family suffering from one form of nervous disease, and one from another. The most frequent nervous "associations" are neuralgia, epilepsy, chorea, gout. This shows that whatever view of the intimate pathology be accepted, a nervous substratum is almost invariable.

Where there is no faulty inheritance it will commonly be found that the nervous system has been brought into a state of imperfect nutrition, either by losses of blood, by want of sufficient fresh air and exercise, by sustained intellectual exertion, or by some exhausting disease.

The chief exciting causes are *worry, fatigue, excitement, impure air, cold, or indiscretions of diet*, the latter acting either alone, or more commonly in association with one of the preceding causes. In many people the combination of the fatigue of a railway journey with an unusually long interval without food, and followed by a substantial meal, will almost certainly cause an attack; whereas none of these conditions acting singly is sufficient. In some very susceptible patients, chiefly women, a railway journey alone is sufficient. The general vibration, and the effect upon the eyes of quickly passing objects, seem to be as important as the mere fatigue; and these are generally associated with either cold or close impure air, both of them important causes of migraine.

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[1] Read before the Nottingham Medico-Chirurgical Society, May 1898.

In speaking of digestive disturbances as a cause of an attack, Gowers writes: "Frequently, after the usual interval between the attacks has nearly elapsed, a slight error in diet is sufficient, although soon after the patient has had an attack even actual indigestion has no effect."

Another frequent cause, which hardly receives the attention it deserves, is *cold*. It acts both by inducing indigestion, and also probably by depressing the nervous centres and leading to vasomotor changes.

In those with a gouty or rheumatic tendency or inheritance, alcohol, especially in the form of the imperfectly fermented wines, such as champagne, is a fertile source of attacks.

In some people *running* brings on an attack, suggesting that disturbance of the circulation may be the immediate exciting cause. The degree of the exciting cause required to produce an attack varies immensely, and inversely with the robustness of the patient.

I know one patient, a lady of about 45, of highly artistic tastes, who has lived chiefly in large towns, and taken very little out-of-door exercise, in whom a visit to the theatre or to a concert is generally followed by one or two days prostrating migraine. No doubt the close poisonous atmosphere plays as important a part as the fatigue and excitement, especially in producing vasomotor changes.

Another patient, subject to attacks every two or three months, married at the age of 40. After about a year a child was born; and for the next eighteen months she devoted herself entirely to the care of the child, never going away from home, being very little out of doors (half an hour to one hour daily), and gradually drifting into a very anæmic condition, with marked impairment of the general health. The reason of my being asked to see her was that the attacks now came on every two or three *weeks* instead of *months*, and the one in which I saw her had already lasted seven or eight days, and was causing alarm from its persistence. The two special causes here were the impaired general health and cold. She was one of those people who have very little cutaneous sensibility to cold, and who, therefore, do not keep their rooms and houses sufficiently warm. But such people often suffer severely from cold in the form of impaired digestion, diarrhœa, and generally depressed vitality. Too much of their energy is used up in maintaining the body heat.

The supraorbital pain is almost always one-sided, hence the name of the disease. But sometimes it extends right across the forehead, affecting both sides at once. In each patient, though one side is more frequently affected than the other, the pain certainly does not always attack the same side. As regards the ocular phenomena (more especially the "fortification" lines) the patient often imagines that only one eye is affected; but closer observation invariably shows that the corresponding halves of both retinæ are always involved, thus indicating that the cause is in the brain above the optic chiasma.

An attack may stop at any stage without completing the whole of the usual cycle of events. Thus the subjective ocular phenomena which, when they form a part of the cycle, are very constant, and form the earliest symptom, are by no means always followed by headache, etc. The threatened attack seems to abort.

Apart from actual nausea, there is generally a complete loathing of food of any kind, but vomiting is not very common. Another symptom, which I have never seen described, but which is fairly constant in those patients in whom it occurs at all, is *breathlessness.* While completely at rest there is a distressing *besoin de respirer,* the patient breathes with effort, quickly and deeply. This is much aggravated by the slightest exertion, such as walking. I would suggest that it is part of the vasomotor disturbance, and consists in a contraction of the pulmonary arterioles; or, that the heart is not quite equal to the extra strain thrown upon it by the sudden rise of tension, so well shown by the small hard contracted pulse; or, the breathlessness may be due to anæmia of the respiratory centre.

In many cases before an attack there appears to be a deficient excretion of urine, which is often loaded with urates. During the attack there is often frequent micturition, and generally a large quantity of pale urine is passed. Not unfrequently, too, there is a *spasm of the urethra,* which causes the urine to be passed in a small stream slowly and with effort. This is a very obvious symptom that I have not seen mentioned in any description of migraine. The most remarkable case of the kind that I have met with is the following:—

J. C., æt. 26, a dark, thin, delicate man, consulted me for attacks of frequent and painful micturition, lasting only from one to three hours at a time, during which he would pass water every ten minutes with scalding and pain in the back. For some years the attacks have come on every few weeks, but lately they have occurred daily. Thinking there might be some local mischief he had been circumcised by one surgeon, and a year or two later another surgeon had incised the meatus. He has no stricture. Between the attacks he is quite well, but lately he has been overworking, and is somewhat depressed. He is married and has one child. I found that he had been subject to migraine from childhood, and the urinary symptoms *always come on with the headache and pass away with it.* I came to the conclusion that the urinary symptoms were part of the migraine, assured him that there was no stone or other local disease, and prescribed phenacetin (10 grs.) to be taken at the commencement of an attack. For regular use I advised iron and strychnia with a saline aperient, feeding up, and more exercise in the fresh air. I saw him again in a fortnight, during which time he had only had one attack instead of suffering daily, and was generally improved.

Another curious phenomenon in which it resembles chorea is the effect of an effort of the will. In all but the severe cases of chorea the movements can be restrained by an effort of the will, for a period varying from a few seconds up to one or two minutes or more. So, in a prostrating attack of migraine, business can be transacted by an effort for a short time, during which the pain seems to abate, or at any rate ceases to monopolise the attention. But, after the effort is over, the pain returns with redoubled violence, leaving the patient exhausted. It would seem as though the mental exertion temporarily relaxed the arterial spasm, which some think causes the pain by cerebral anæmia; while usually any kind of exertion, mental or bodily, aggravates the pain sooner or later. I have known one or two patients in whom a moderate attack was always characterised by unusual restlessness—papers and drawers must be looked through, and everything "tidied up," etc. etc. Not unfrequently an attack is preceded by unusual irritability of temper.

In considering the pathology of migraine it is evident that in a typical attack there are disturbances in the nervous, circulatory, and alimentary systems; and we have to decide which, if any, is predominant and essential.

Gowers says "the most recent hypotheses refer migraine to a vasomotor disturbance." And, again, "the frequency of vasomotor derangement will be variously estimated according to the phenomena included in the term, and if a simple change in frequency or tension of the pulse, or in the colour of the face, is included, this disturbance becomes one of the most frequent features of the attacks. Vasomotor disturbance may be present in some form throughout an attack, or may come on only towards the close."

The theory of Dr. Latham (1872) is that in the early stage the affected side of the brain is anæmic; and the contraction of the blood vessels of the hemisphere is itself due to a morbid activity of the sympathetic nerve. In the stage of headache he supposes that there is a secondary hyperæmia, consequent upon the exhaustion of the vasomotor apparatus.

Du-Bois Reymond (1860) maintained that, at least in his own case, migrainous headache was due to a tetanus of the muscular coats of the vessels of the affected side, in the territory of the cervical sympathetic. Möllendorf (1867) and Wilks (1869) endeavoured to prove that the complaint is caused by a dilatation name of the disease. But sometimes it extends right across the forehead, affecting both sides at once. In each patient, though one side is more frequently affected than the other, the pain certainly does not always attack the same side. As regards the ocular phenomena (more especially the "fortification" lines) the patient often imagines that only one eye is affected; but closer observation invariably shows that the corresponding halves of both retinæ are always involved, thus indicating that the cause is in the brain above the optic chiasma.

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It seems to me, too, that the phenomena of an attack lend themselves very readily to the explanation of vasomotor changes as the proximate cause. The pale face, cold surface and extremities, small hard pulse (which may sometimes be retarded to 50 or even 40 beats per minute) and the copious flow of pale urine of low specific gravity all point to contraction of the arterioles, raised blood tension, and anæmia of the surface and extremities, with accumulation of blood in the large veins of the abdomen. There is nothing to show whether the brain is anæmic or hyperæmic, but only an indication of a general rise of tension. The reasons for thinking that in this early stage there is anæmia of the whole or of part of one hemisphere are the following:—

The ocular phenomena are indicative of imperfect function, and, therefore, of imperfect blood supply of the visual centre in the brain—the occipital lobe.

Headache is quite as much associated with anæmia as with hyperæmia of the brain.

The functional activity of the brain as a whole is diminished, and especially is there in many cases impaired power of recalling words, and occasionally distinct, though transient, aphasia. Rarely there may be tingling in the arm and leg of the affected side. From the analogy with hemiplegia, due to sudden cutting off of the blood supply of a portion of the brain by embolism or thrombosis, one must suppose these symptoms to be due to anæmia rather than to hyperæmia.

Holding the breath and straining, which retards the exit of blood from the brain through the cerebral veins, sometimes temporarily relieves the pain.

The next stage is characterised by relaxation of the spasm, softening of the pulse, which becomes throbbing and bounding. The surface and extremities are flushed with blood. This foreshadows a speedy end to the attack, although for a time the throbbing of the vessels may increase the pain.

It is well known that when with headache the extremities are cold, some relief is obtained by warming the hands and feet at the fire. In many cases the recumbent position is required in addition. In a large class of patients an attack may be cut short by many hours by going to bed, applying hot bottles to the extremities, and drinking (as soon as the stomach will retain it) some hot tea or milk. A glow soon pervades the surface, and the spasm is relaxed. Relief so obtained is not very liable to relapse. After a few hours the ordinary duties of life may be resumed, and although sleep is the best completer of the cure, its place may sometimes be taken by a good dinner.

I believe this treatment, where it can be carried out, to be far superior to any drug treatment, though it may be aided by a good dose (30 to 60 grs.) of bromide of potassium. It is a curious fact, and may be taken as the exception which proves the rule, that a few patients find the recumbent position aggravates their pain, and even prefer to spend the night in an armchair rather than go to bed. And also, in the later stages, moving about sometimes seems to hasten the end of an attack more than remaining quiescent.

It is a remarkable confirmation of the vasomotor theory that the chief remedies, which are very valuable in some patients (but by no means in all) are antipyrin and phenacetin; both of them powerful vaso-dilators.

Opium not only fails to relieve the headache, but generally increases it, unless given in such large doses as to compel sleep; and then, on waking, the pain generally returns. And opium contracts the vessels.

The action of citrate of caffeine is very variable. In some patients it gives relief with great certainty, but in the majority it fails. It stimulates the heart, and contracts the arterioles to a less degree. It is conceivable that it succeeds when it acts chiefly upon the heart, and fails when its chief effect is in contracting the arterioles.

Not unfrequently the digestive disturbance terminates in a spontaneous attack of diarrhœa, which may be regarded as a natural mode of cure. In other cases a brisk saline aperient gives great relief, and cuts short an attack. It will be noticed that in each case the effect is to reduce the high blood tension, soften the pulse, and relax spasm.

It has been remarked by many observers that after 45 to 50 years of age the attacks become much less frequent, or cease altogether. Perhaps the most striking change at this period of life is the loss of elasticity and contractility of the blood vessels. The vasomotor system becomes less mobile.

Another remedy which has been highly praised, when given regularly in the intervals, is nitro-glycerin. It, again, is a very powerful vaso-dilator and relaxer of spasm. Its well-known tendency to cause frontal headache makes it not unfrequently increase the pain, if given during an attack. But the beneficial effect of its regular use seems to be due in part to improved nutrition of the brain, from flushing it with blood.

The treatment of the attack itself, however, is very different from that required to prevent or delay the recurrence of attacks. There is no doubt that migraine specially affects town-dwellers and brain-workers. The opposite conditions promote cure.

Relaxation from work, and an active life in the country, where six or eight hours are spent in the fresh air every day, do much to diminish the frequency of the attacks. It may be necessary to recommend residence in a warm climate during the winter, in order that a larger amount of time may be spent out of doors. The benefit of an ordinary summer holiday is striking, and those who are accustomed to attacks every week or two when working in a town seldom suffer during a holiday in the country, unless from over-fatigue.

Owing to the strongly hereditary character of the disease, absolute cure is rare, as might be expected. And, moreover, a complete change in the mode of life is seldom possible, and may frequently be considered worse than the disease. Otherwise our results would be better, but considerable improvement is common and easy to obtain.

NUCLEIN IN A CASE OF MALIGNANT DISEASE, WITH A NOTE ON THE URIC ACID EXCRETION.

By Carstairs Douglas, M.D., B.Sc., *Glasgow.*

A certain amount of interest has been aroused of late by the introduction of pure nuclein or nucleinic acid, as a therapeutic agent in the treatment of infective diseases, but as yet clinical reports are scanty, and have emanated chiefly from our Transatlantic colleagues, stimulated by the work of Vaughan[1] and Chittenden.

Nuclein has been employed in tuberculosis, diphtheria, typhoid, pneumonia, etc., it being claimed either that its administration increases the polynuclear corpuscles (Vaughan), or that it acts beneficially in virtue of its own power as a germicide. Hahn[2] states that it has been shown by Buchner that exudates do not lose their bactericidal powers when the leucocytes are killed by freezing, and that therefore these powers are due, in part at least, to a chemical secretion or product. Hofbauer[3] used nuclein in Schauta's clinic, in the treatment of grave puerperal disorders, but as yet has abstained from giving a positive opinion.

It is as yet, perhaps, too early to say what place nuclein should hold as a therapeutic agent; and as clinical reports on its use are few, I have ventured to publish this account of its employment in a case of malignant disease, especially as there were some points of interest in the case connected with the uric acid excretion.

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[1] *Med. News*, Phila., December 1894.

[2] *Berl. klin. Wchnschr.*, November 1896.

[3] "Zur Verwerthung einer Kunstlichen Leukocytose bei der Behandlung septischer Puerperal processe," *Centralbl. f. Gynäk.*, Leipzig, 1896, No. 17.

Every man in practice is affected again and again, not only by the sufferings of his cancer patients, but also by their cachexia and increasing weakness; the former he can, in some measure at least, relieve—can he do anything to conserve the steadily ebbing strength of the victim of malignant disease or lessen the cachectic pallor? "We may," says Roger Williams,[1] "but interpret these symptoms as a result of a general toxæmia, the result of degenerative changes in the constituent cells of cancer, changes which may be so extreme as to lead to their complete destruction by disintegration. These excrementitious products being absorbed, and not being quickly enough eliminated and destroyed, produce a kind of auto-intoxication."

Believing that the cachexia is due to the presence of toxins in the blood, and that nuclein has already been used with some apparent benefit in other affections where harmful results follow the absorption of toxins into the economy, it appeared to me to be, at least, legitimate to try its effect in the cachexia of a case of Malignant disease. I conceived, in a somewhat sceptical spirit certainly, that if good were to follow it must be due rather to the purely chemical action of nuclein than to its power in increasing the number of leucocytes, as hyperleucocytosis was already present in this case to a marked degree. Cabot[2] states that when leucocytosis occurs in cancer, the increase is in the adult cells at the expense of the younger, that the eosinophile are not always notably decreased, though Zuppert says they are, and that usually there is a small percentage of myelocytes.

The patient selected for trial was Mrs. H., a stout yet markedly cachectic and enfeebled woman of 38, in whom vaginal hysterectomy had been performed in February 1897, for carcinoma uteri; recurrence showed itself distinctly in the right iliac fossa in July. Anæmia was marked, leucocytosis was pronounced, and feebleness was great. Pain, which was considerable, was relieved by morphia. Her diet consisted chiefly of milk and soda water, bread and butter, vegetables and fruit, eggs and white fish. As her general condition was a pitiable one, I determined to try nuclein, in the hope that it might lead to some improvement in bodily health.

The nuclein used was kindly supplied by Messrs. Parke, Davis, and Co. of London, for the purpose of clinical trial. It is stated to be a 5 per cent. solution of pure nucleinic acid from yeast, and adapted for oral administration.

Chittenden[3] found the dried acid contained 5·71 per cent. of phosphorus. The solution is a brown liquid of strongly acid reaction with a cresol-like odour and taste, due to the fact that it contains ·25 per cent. of tricresol as a preservative. Millons' reagent gives an opaque white precipitate, and bromine water one of yellowish-white colour similar to that of tribromophenol; it does not give the biuret reaction, and the addition of dilute hydrochloric acid and some alcohol produces a white flocculent precipitate of nucleinic acid.

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[1] "The Cachexia of Cancer." *Edin. Med. Journ.*, 1897, vol. i. p. 608.

[2] "Clinical Examination of the Blood," 1897, p. 308.

[3] "Some Points concerning Nuclein, with Observations on some Commercial Products," *New York Med. Journ.*, 1896.

The administration was commenced on August 18, a small teaspoonful, well diluted, being given three times daily between meals.

It had no effect whatever on digestion or the functions of the bowels, but the urine prevented certain features of distinct interest. It will be advisable to give, in the first place, the analysis of the urine when the patient was taking no drug save morphia:—

Amount (twenty-four hours) . . .	625 c.c.
Specific gravity	1018.
Urea	9·09 grms.
Uric acid	4·354 „
Phosphoric acid	5·21 „
Acetone	Absent.
Indican	Normal.
Ethereal sulphates	...
Creatinin	Normal.
Bile salts	Absent.
Albumin, sugar	
Blood, bile pigment	

The reaction was moderately acid, and the microscope revealed nothing of special interest. We note in the first place that, in addition to the total output being small, the daily excretion of urea is very low, being reduced to less than one-third of the normal. This was due probably to the small amount of nitrogenous food ingested, and may have been aided by secondary growths in the liver, affecting its urea function. On the other hand, we notice an enormous increase in the uric acid, which was present as quadriurates, not free; while the urea is diminished to one-third of the normal, uric acid is present to the extent of seven or eight times the ordinary amount. The reason of this lies no doubt in the marked leucocytosis, the uric acid being produced in the body from the nuclein of the leucocytes, according to the view held by Horbaczewski.[1] It has been frequently noted that uric acid is present in excess in diseases associated with leucocytosis, and v. Jaksch[2] has found it in the blood of patients suffering from severe primary and secondary anæmias, in cardiac disease especially with cyanosis, emphysema, febrile stages of pneumonia, and in typhoid and intermittent fever after the fever had subsided.

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[1] *Sitzungsb. d. k. Akad. d. Wissensch.*, Wien, 1891.

[2] "Ueber Urinacidæmie," *Deutsche med. Wchnschr.*, Leipzig, 1890, S. 741.

As Luff[1] points out, these patients do not suffer from any sign of gouty disturbance, because, though uric acid is produced in excess in the system, the kidneys, if sound, are quite able to eliminate it before any has been deposited as the biurate. This was so in this case, there being no sign of uratic deposit, although the blood must have contained a large excess of uric acid, since the ratio of that excreted was to urea nearly 1 to 2, whereas the normal ratio varies between 1 to 30 and 1 to 50 (Roberts).[2] This is quite in contradiction to Haig's[3] well-known views on the ratio of uric acid to that of urea. He says: "There is absolutely no proof that the most gouty man in the kingdom forms or has ever formed uric acid in any greater relation to urea than 1 to 35," and adds that "he will not have too much uric acid, unless he swallows it ready formed in his food and drink." In my case the patient was taking a diet largely free from xanthin compounds, yet was forming in her system an enormous quantity of uric acid without any discomfort whatever either from mechanical or toxic causes.

Phosphoric acid was also present in excessive amount, the cause of which, in part at least, may also be ascribed to phosphorus derived from the nuclein of disintegrated leucocytes. v. Mayer[4] found that there was a small yet distinct increase in the phosphoric acid excreted when nuclein was administered to a patient. It is possible, too, that one of the causes of the increased excretion lies in the absorption of the inorganic constituents of bone, which Williams[5] declares is frequently present in the subject of malignant disease, and which produces a condition of fragilitas ossium, comparable to that found in the insane, in osteomalacia, and in chronic phosphorus poisoning.

Acetone, which has been frequently found in the urine of those suffering from malignant disease, was absent. The other urinary constituents noted were in nowise abnormal, and though there was marked constipation there were no indications that any auto-intoxication was taking place from the intestinal tract.

On 18th August, as noted above, the patient commenced to take the nuclein, and on 3rd September the urine presented the following features: it was very scanty, highly acid, and loaded with quadriurates. Chemical examination yielded the following results:—

Amount (twenty-four hours) . .	420 c.c.
Specific gravity	1024.
Urea	9·735 grms.
Uric acid	4·876 ,,
Phosphoric acid	5·09 ,,

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[1] "Chemistry and Pathology of Gout," 1897.

[2] "Uric Acid, Gravel, and Gout," 1892, p. 33.

[3] "The Uric Acid Diathesis," *Edin. Med. Journ.*, 1897, vol. ii. p. 39.

[4] *Deutsche med. Wchnschr.*, Leipzig, 1896.

[5] *Op. cit.*, p. 613.

Acetone	Absent.
Indican	Subnormal.
Ethereal sulphates	,,
Creatinin	,,
Bile salts	Absent.
Albumin, sugar	
Blood, bile pigments	

It is to be noted that while there is a slight increase in the urea excretion (7 per cent.), the uric acid is increased to the extent of 11 per cent. The absolute increase is equal almost to the total daily excretion of an ordinary person (·522 grms.), and may in all reason be attributed to the ingestion of the nuclein and its destruction within the body. Horbaczewski[1] found that when pure nuclein, prepared from spleen pulp, was dissolved in very weak alkali, and digested with blood at 40° C., uric acid was obtained, and also that the administration of nuclein increased the elimination of uric acid. Hofbauer[2] found in all the cases in which he used nuclein that the uric acid excretion was augmented, though Mayer[3] did not obtain this result. At this time, contrary to expectation, there was a slight fall in the excretion of phosphoric acid, though it still remained very high. During this time the patient suffered no gastric or other disturbance from the nuclein, and after about three weeks' trial said she felt certainly better and fitter for exertion, while her skin had become somewhat clearer and less yellow and cachectic. This is just the kind of case where a "faith cure" may be looked for, and I had accordingly sought to remove the possibility of anything of this kind by warning the patient at the beginning that this was merely a trial of a remedy that might do a little good, while on the other hand it might have no effect in the slightest way beneficial, and at the very best any benefit that might accrue would be quite temporary. There is no doubt, however, that for a short time the patient felt and looked better; after a little, however, she complained of the state of the urine, which still continued very scanty and loaded with lateritious deposit. The nuclein was therefore stopped for a time, and an alkaline diuretic exhibited for a few days, with the following results as regards the urine:—

Urine nearly clear	Moderately acid.
Quantity (twenty-four hours)	425 c.c.
Specific gravity	1018.
Urea	6·18 grms.
Uric acid	4·283 ,,
Phosphoric acid	2·26 ,,
Acetone	Absent.
Indican	Slight increase.
Ethereal sulphates	Diminished.

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[1] *Op. cit.*

[2] *Op. cit.*

[3] *Op. cit.*

Creatinin	Normal.
Bile salts	Absent.
Albumin, sugar	
Blood, bile pigments	

There was at this time a marked decrease in the urea excretion, while that of uric acid still continued very high, though distinctly less than when the patient was taking nuclein. The phosphoric acid was reduced to one-half of what it was formerly. The patient went on again with the nuclein, but ere long it ceased to produce any good result; she deteriorated steadily in health, a sharp hæmorrhage from the vagina took place on December 28, and on the following evening she died.

The chief points worth noting are—

1. The constant high excretion of uric acid, the result most likely of the leucocytosis.
2. The fact that there were no symptoms of toxic effect from uric acid nor any evidence of uratic deposit, showing that the latter does not tend to occur if the kidneys functionate well.
3. The increase of uric acid on administering nuclein and the diminution of it on stopping the doses.
4. The large quantity of phosphoric acid excreted.
5. The fact that the nuclein appeared to produce a temporary feeling of betterment; this was, however, quite transient, and there was no arrest of the steadily advancing cachexia; the drug was borne well by the patient.

(The uric acid was estimated by the method introduced by Hopkins, slightly modified.)

TROPHO-NEUROSIS OF THE UTERUS.

By James Oliver, M.D., F.R.S.Ed., *Physician to the Hospital for Women, Soho, London.*

The disorder which I characterise as tropho-neurosis of the uterus is one of not infrequent occurrence, and one to which for several years I have drawn the attention of my clinical assistants. The existence of trophic nerves, it is true, has not yet been satisfactorily demonstrated, but physiologists admit that "there is evidence in favour of the view that some more or less direct influence of the nervous system on metabolic actions, and so on nutrition, will be demonstrated by future inquiries."[1]

In the case of an important organ like the uterus, an organ which, during the child-bearing epoch, is subjected to periodic variations of its state, and which may display those great evolutionary and dissolutionary phenomena which we witness in association with gestation and parturition, it is highly probable that its nutritive processes are to some extent dominated by nerves of a trophic nature, and this hypothesis is, in my opinion, supported by facts.

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[1] Foster, "Text-Book of Physiology," 4th edition, p. 473.

Before detailing the physical signs which characterise, and the symptoms which may be observed in association with, trophoneurosis, a few observations regarding the physical state of the healthy uterus may here be interposed.

The uterus is a muscular organ. It is enveloped somewhat extensively by an elastic membrane, which constitutes a portion of the general peritoneum. This covering under normal conditions is passively extended, and exerts constantly a greater or less amount of pressure on the underlying tissue, which is thus correlatively compressed. Now the uniform consistence of the uterus, and its erect position in the pelvis, depend upon the maintenance of a harmonious relationship between the two structures—the peritoneal and the muscular—the vital forces of which oppose each other. If the elasticity of the enveloping membrane becomes impaired, or the tension of the muscular tissue is unduly diminished, then the stiffness and elastic rigidity of the organ will be injured, and consequently its consistence and its position in the pelvis may be altered. Every one who, by abdominal section, has dealt with abscesses and cysts in the broad ligaments, is familiar with the very highly elastic property of the pelvic peritoneum, for, when the fluid distending the broad ligament is withdrawn, the cavity becomes rapidly and amazingly diminished.

To illustrate this question of the relationship of the muscular tissue of the uterus to its serous covering, I cannot do better than quote a simple experiment which can be made with a portion of a large leaf-stalk from a rhubarb plant. "Let us suppose the object cut off square above and below, and its length to be about 50 cms. If, now, a strip of the epidermal tissue, together with the collenchyma layers which strengthen it, are removed completely, and the attempt is then carefully made to lay this collection of tissues again into its place, it is observed that the epidermal strip is too short, it has become elastically contracted during the separation, and thus, in the natural condition of the object, had been passively extended. If the whole epidermis is now removed all round, and the length of the very succulent cylinder (which consists chiefly of parenchyma and very extensible vascular bundles which scarcely come into consideration here) is measured, it is found to have increased very considerably in length during the manipulation. Not rarely, such a cylinder becomes extended from 50 cms. to 53 or 55 cms., or even more."[1]

When the physico-chemical state of the muscular tissue of the uterus is more or less extensively deranged, in consequence of an impairment of its nutritive processes, the organ becomes so weakened that it assumes a dependent position. The fundus under such circumstances, may be directed forwards, backwards, or to one or other side of the pelvis; retroversion is, however, the variety of displacement that most commonly results. The consistence of the uterus suffers as well as its position. Sometimes it is merely plastic and impressible, but more usually it is irregular, and appears to be traversed by bands, which one likens to the *columnæ carneæ* of the heart. This detectable alteration in the physical state of the organ may be general, or it may be limited to one-half and even a lesser portion of the uterus.

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[1] Sach's "Physiology of Plants," p. 216.

In uncomplicated cases the symptoms noted in association with this disorder are of a specific type. There is often a marked diminution in the amount of the menstrual discharge, sometimes a delay in its recurrence, and occasionally an entire "period" even may be missed. Menorrhagia is a symptom less frequently observed, but when it occurs one is disposed to attribute it to a lessened capability of the structure to respond to the inhibitory influence. Dysmenorrhœa is sometimes complained of, especially in those cases in which the menstrual discharge is unduly scanty.

THE CLIMATE OF TENERIFFE: OROTAVA AS A HEALTH RESORT.

By Frederick Lishman, M.D. (Edin.).

The island of Teneriffe, the largest and most important of the Canary group, with a population of about 110,000, is situated between latitudes 28° and 29° N., and about 200 miles distant from Cape Juby, on the African coast. It is in regular and frequent communication with England—five days from Plymouth, six days from Southampton, and a week from London or from Liverpool.

It has for long been famous among all the provinces of Spain for the salubrity of its climate, and the choice it offers within so small an area, according to altitude and position, for the treatment of different classes of maladies. But, though some few English people have made the island their home for the last thirty or forty years, it is only since ten years ago that it has come to be widely known among us as one of the most benign climates in the world, and has attracted a large number of permanent English residents, with an annually increasing number of visitors, in search of health and pleasure.

The general features of Teneriffe may be very briefly described. It is fifty-two miles long by thirty-one broad. A lofty volcanic range of mountains runs like a backbone along its whole length, increasing in height from 3000 feet, towards the northern extremity, to the gigantic Peak, which pierces the heavens 12,200 feet above the sea. It is the northern and fertile slope formed by this ridge, dropping gradually towards the sea, with which we are principally concerned. The valley of Orotava is like a huge amphitheatre cut out of the northern slope, facing the Atlantic Ocean, and sheltered behind and on two sides by the mountains.

Orotava, by far the most favoured and popular resort in the island, is—as Humboldt said in his "Views of Nature"—"one of the most charming spots in the world," and remarkable for the magnificence of its mountain and coast scenery. Its climate will be described as a general type, but, it must be emphasised, that in the island are several totally different climates, according to the altitude and local feature.

1. *Winds.*—Orotava is exposed to the north, north-east, and north-west. The prevailing wind is from the north in winter, and is extremely moderate in force, usually beginning some hours after sunrise, and dying down towards sunset, to be replaced by the "terral" or gentle land breeze, which lasts throughout the night. These ocean breezes are healthful and invigorating, being heavily charged with ozone, and are absolutely free from dust and germs.

High winds are very uncommon, and when they occur are brief. In summer the cool north-east trade-wind blows with great regularity day after day, tempering the heat of the subtropical sun; it gives place at infrequent intervals to the hot, dry south wind, which persists usually not more than three days. While the trade wind prevails the weather is never oppressive.

The *temperature*—as is to be expected in a small island—is remarkable for its equability and freedom from extremes of heat and cold. The relatively high temperature of the sea, varying from 65°·7 F. in January to 73°·5 in August, which is due to the influence of the Gulf Stream, contributes markedly to this equability.

TABLE I.—*Means of Shade Temperature* (70 *Feet Level*).[1]
Eight years, 1890–1897.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Mean .	61°·2	61°·6	62°·6	62°·6	68°·3	69°·8	72°·5	73°·3	72°·7	71°·2	67°·1	63°·7
Max. .	68°·0	68°·6	68°·1	68°·5	73°·1	77°·0	79°·2	80°·2	79°·7	78°·1	73°·9	70°·6
Min. .	54°·4	54°·5	55°·6	57°·1	58°·6	62°·6	65°·9	66°·7	65°·6	64°·4	60°·0	56°·7
Range .	13°·6	13°·7	13°·9	13°·9	14°·5	14°·3	13°·2	13°·6	14°·0	13°·7	13°·9	13°·6

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[1] This and the following tables (except Table IV.) have been compiled from the observations taken at the Meteorological Society's Station in Orotava, by Mr. Alfred F. Perry, to whom I am much indebted for the use of them. The station is 70 feet above the sea-level.

The diurnal variation is seen to average 13°·8, and is practically the same in winter and summer. The annual variation is also very small—the difference between the mean temperature of August, the hottest month, and January, the coldest, being only 12°·1 F.

The highest and lowest shade temperatures recorded each year since 1890, are as follows:—

Table II.—*Extreme Shade Temperatures recorded.*

	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Means.
Highest . . .	79°·7	84°·5	82°·8	86°·0	88°·0	89°·9	90°·1	88°·5	86°
Lowest . . .	48°·6	48°·4	50°·6	50°·6	50°·0	50°·7	50°·2	50°·3	49°·9

The average extreme annual variation is thus seen to be 36°·1 F., and it will be noted that the lowest temperature in the eight years was 48°·4 F.

These figures illustrate well the benign nature of the climate.

The *rainfall* is very moderate throughout the island, but is somewhat greater in the parts more distant from the African coast.

In Orotava the observations are as follows:—

Table III.—*Rainfall—Eight Years* (1890–97).

Means.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec	Annual.
Amount (inches).	3·10	1·83	2·31	1·34	0·49	0·05	0·02	0·05	0·27	2·64	2·09	2·5	16·0
No. of rainy days (·01 in. or more).	8·5	6·8	8.5	5·3	2·2	0·3	0·5	0·5	1·8	6·8	9·5	8·7	59
No. of rainy days (during day).	5·5	4·0	3·1	2·9	0·5	0·1	0·0	0·1	0·7	3·4	5·5	4·7	30

The average rainfall of the last eight years has been 16·0 in., spread over fifty-nine days, but during the daytime on only thirty occasions. During the ten years, 1874–84, the rainfall was not so high, averaging 13·02 in., spread over forty-three days; the observations were taken by Mr. Honegger at Orotava, 300 feet above the sea.

TABLE IV.—*Rainfall—Ten Years*, 1874–84 (*Honegger*).

Means.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
Inches . .	1·96	2·50	2·08	0·74	0·43	0·00	0·00	0·03	0·07	1·37	1·72	2·12	13·2
Days of rain . (·01 in. or more)	6·5	6·3	8·4	5·0	3·0	0·6	0·4	0·2	1·4	5·7	7·1	7·2	43

Practically no rain falls, from the end of April to October. The wettest months are usually December and January.

During bad weather short and heavy showers are the rule, and mostly in the night.

As an example of the large amount of rain, which may fall in a short period, may be mentioned the experience of 25th October 1895, when 4·15 in. fell in fifteen hours.

Owing to the dry and porous volcanic soil and the general inclination to the coast, the heaviest rains soon disappear and leave no trace.

A day wet all through is not often experienced, and the occasion rare when an invalid cannot at least spend some hours in the open air. Fogs are, I believe, unknown in Orotava.

TABLE V.—*Relative Humidity. Saturation*, 100.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Mean.
Day .	71·3	67·7	70·3	69·5	69·1	69·2	72·9	73·0	72·1	73·4	73·0	72·2	71·1%
Average, day & night	75·4	72·4	74·7	75·2	73·5	74·4	78·3	79·7	78·0	78·2	77·0	75·5	76%

The humidity of the atmosphere is much less than might be supposed from the insularity of the climate. The average percentage during the day being 71°·1 per cent. of saturation, which may be compared with the average for Brighton 81°, Ventnor 81°, Torquay 81°, Falmouth 82°, and Guernsey 85°.

During the night the humidity is greater, but it seldom reaches the point of saturation, and dew is rarely deposited.

TABLE VI.—*Sunshine*, 1890–1897.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Hours . .	147	167	170	174	200	192	165	165	180	166	153	145
Days with less than one hour recorded sunshine	3·5	1·3	2·4	2·4	3·0	3·7	4·9	3·2	2·4	3·0	3 0	3·5

The annual average of recorded bright sunshine is 2007 hours. The actual amount is greater in the summer months, but the percentage is slightly less in that season—for this reason: the "parasol of clouds," formed by the impact of the moisture-laden trade winds against the cold mountain heights, gathers with great regularity in the hottest hours of each day. This parasol sometimes extends for a distance out to sea, but frequently is limited to the upper parts of the valley, the coast line being in bright sunshine. The effect of this cloud is somewhat to increase the humidity under it, but it provides a truly welcome shade from the scorching rays of the midday sun, and is an important feature in contributing to the equability of the temperature.

In addition to its magnificent climate and natural beauties, Orotava offers more social attractions than any other resort in the Canaries.

There is a permanent English society, with church and resident chaplain all the year round. The accommodation for invalids is most comfortable—there is a choice of hotels at different levels, and some resident English families take in boarders.

The water supply is excellent and the food good.

The best level is from 100 to 400 feet above the sea. Bedrooms looking to the north are best, they are cooler in the day and warmer at night.

The best months are from November to June, at the ordinary levels.

A much cooler climate is always available and within easy reach for such as require a change to a more bracing atmosphere. For instance, at Laguna and Tacoronte (nearly 2000 feet), a few hours' drive from Orotava by a good road, the invalid has good accommodation, and will rarely in summer find the maximum shade temperature exceed 70° F.

In the higher parts of the valley of Orotava, *i.e.* above the cloud level of 4500 ft., nothing is more delightful nor healthful than camping out among the fragrant pines and the heather under the brilliant cloudless skies.

During the rainless months such a life is an ideal one for those in search of health, and English residents in Orotava frequently avail themselves of it.

At the village of Vilaflor, 4662 feet above sea level, beautifully situated in the zone of pines above the level of the clouds, perpetual sunshine and an exquisite air delights everyone who is energetic enough and able to undertake a fatiguing day in the saddle.

The following observations were taken at Vilaflor, during part of the summers 1890 and 1891, by Mr. P. R. Bedlington, Assoc. Met. Inst. The atmosphere is remarkable for its dryness:—

TABLE VII.—*Vilaflor*, 1890–91.

Means.		April.	May.	Aug.	Sep.
Shade temperature	F.,	57°·8	56°·8	76°·7	66°·8
Humidity	Saturation, 100	56·7	63·3	35·7	53·6
Rain	Inches	0·17	1·8	...	0·03
Rain	Days	1	4	...	1
Sunshine	Hours	206	256	...	275

Of the other resorts in Teneriffe the most important are—

1. Santa Cruz, the port of call of all steamers; it is hotter and dryer than Orotava, and the best months are January, February, March.

2. Güimar (1200 ft.), on the southern side of the island, possesses an excellent, dry, bracing climate, the best months being January, February, March.

3. Laguna (2000 ft.), already spoken of, has a delightful bracing summer climate, and is much frequented from June to October.

These places are all to be more recommended as offering an occasional desirable change from the monotony of Orotava than as *permanent* resorts.

For the large class of cases, which require something more than a "winter abroad," Teneriffe offers unique advantages.

First among these must be put cases of Bright's disease, which do extremely well, particularly cases of the large white kidney in young adults; the skin acts freely, the secretion of urine is soon greatly increased, together with the amount of urea, albumin diminishes, and the desirable change into the contracted kidney is gradually effected.

For all chronic kidney cases a safer climate could hardly be found.

Secondly, Cases of emphysema and chronic bronchitis all do well and are specially suitable.

Thirdly, Cases of tubercular lung disease for the most part do extremely well, as in no other climate can the open-air treatment be more completely carried out.

Some of the more robust of patients from our northern latitudes find the climate too mild and uneventful, but for all who want warmth it is admirably adapted.

Cases that do specially well are those associated with much catarrh, with hæmorrhage, or with disproportionate constitutional symptoms; laryngeal cases sometimes do very well in Orotava, but a cure cannot always be looked for.

Those cases with any intestinal complications are contra-indicated, being almost always aggravated, and also cases of *advanced* lung disease.

Tubercular conditions of the urinary organs are usually regarded as being uninfluenced by climate, but I have notes of two cases of tubercular cystitis, which have almost completely recovered. One sent here by Mr. Reginald Harrison, after many years unavailing treatment; the other sent to me by Dr. Williamson of Ventnor, after having undergone prolonged treatment for the bladder condition in a London hospital, which had only aggravated matters.

Rheumatic cases with associated heart disease are usually much benefited by the absence of all cold winds and the warmth of the nights. Concerning asthma, here as elsewhere, no rule can be laid down; I have known some cases do remarkably well in the island, particularly those with much associated emphysema and bronchitis.

Of the many popular foreign resorts, to which English physicians recommend their patients, probably there is not one which offers the same facilities and climatic advantages for such cases as require prolonged continuous treatment, and especially permanent residence abroad, as the island of Teneriffe. Take Egypt which has an excellent winter climate, take the various resorts on the Riviera and in the Engadine, to which invalids crowd in search of health. In most of these the annual variation of temperature is so great as to preclude all the year round residence. No sooner has the damaged constitution begun to react to the favourable climatic influences than the patient is ordered home to escape the summer heat, the cure which was begun is never consolidated, and ultimate results are disappointing.

The short sea voyage should not be considered a disadvantage; it can be made in luxurious steamers, and is almost always beneficial to invalids; while on the return to England, the week at sea is a safeguard against the dangers of a sudden transition into colder weather.

CLINICAL RECORDS.

A CASE OF MEMBRANOUS COLITIS.[1]

By W. R. Dawson, M.D., *Farnham House Asylum,*
Finglas, Dublin.

The comparative rarity of the condition described under the above and a host of other names seems to justify the publication of the following case:—

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[1] Somewhat modified from a paper read in the Section of Medicine, Royal Academy of Medicine in Ireland, 20th May 1898.

A medical gentleman, æt. 42, apparently in excellent health, mentioned to me last autumn that he was habitually passing from the bowel a quantity of membranous-looking material. He had then been resident in this asylum for about a year, but previously made no complaint of this condition, although he had long noticed it, and indeed it is to notes with which he kindly furnished me that I am indebted for many of the following facts. The history relative to this condition is as follows:—

The patient had formerly been addicted for a long time to the use of cocaine, and had observed that when under the influence of that drug his stools were paler than normal, but there has never been any jaundice, and until about three years ago the bowels acted fairly—at all events, there was no habitual constipation. At that time, however, the latter set in rather suddenly, and has persisted, becoming indeed worse, so that for about two and a half years the bowels have rarely moved normally. There have, however, been no constant dyspeptic troubles, though some malaise and loss of appetite at times. At first, when two or three days were allowed to intervene between the motions, and also on a few occasions when a fœtid diarrhœa occurred, there were more or less severe colicky pains before and during the passage of fæces, but this symptom has long been conspicuous by its absence.

Somewhere under two years ago, imagining that the symptoms might be due to a tænia, he had himself treated with the usual vermifuges, but apparently without result. About the same period, however, *i.e.* a year or so after the commencement of the habitual constipation, he observed that enemata and aperients brought with the fæces smooth rounded or oval masses, light brown or white in colour, and apparently consisting of undigested food, while the evacuations were followed by a discharge of mucus. White shreds and patches of membranous structure then began to come away, and these phenomena were accompanied with intestinal flatulence and eructations of gas from the stomach. The symptoms persisted in varying degree, but were remittent, being almost in abeyance for two or three months at a time, when an exacerbation would occur and last a week or two.

At the beginning of January 1897, about nine or ten months before the patient spoke of the membranes, he showed me a white structure, several inches in length, which he had brought up (by eructation rather than actual vomiting) in the night. Neither of us doubted that it was a portion of tænia; and though in the light of subsequent information one may hesitate about this diagnosis, I mention the fact for what it is worth. He was several times submitted to treatment with oil of male-fern, turpentine, etc., and seemed to be decidedly better afterwards, though no proglottides were found.

From the time when the condition was diagnosed as membranous colitis, and came under more special observation, it has never been entirely absent (though sometimes manifested only by the presence of ordinary mucus), the exacerbations above alluded to occurring from time to time. Thus there was a rather severe one about Christmas; another, less severe, in the beginning of April; and the patient has been suffering from one for the past few days (8th June). On these occasions the first sign was the discharge of particles of undigested food, followed later by the appearance or increase in quantity of the membranes, the bulk of which come after the fæces. There is, at the same time, an unusual sleepiness and lassitude, with incapacity for mental rather than for physical exertion; while eructations of gas from the stomach, especially just on waking, and sudden transient sensations of nausea at meals, have also been present. The discharge of membranes has been found to be increased during catarrhal inflammations elsewhere, coryza for example, and also by the exhibition of saline aperients (not other aperients), and the patient thinks that certain articles of diet produce this effect. Constipation still persists, an enema of warm water or glycerin having to be used daily; and the tongue is habitually covered in its posterior third with a thick brown fur, though clean in front. The liver is very slightly enlarged, the edge projecting a little below the costal margin, but no enlargement of the spleen has been detected. Pressure over the lower ribs in the region of the posterior axillary line, on the right side, always gives rise to a certain uncomfortable sensation, with borborygmi and eructation of gas, and this becomes distinctly worse during the exacerbations. There is, however, no actual pain, nor is there elsewhere abdominal tenderness at any time. No blood has ever been passed in the stools, except a little from piles. No abnormality has been observed in the urine. The exacerbations cause no cardiac symptoms. Assimilation and general nutrition have not been at all affected, the patient being otherwise in splendid health, and maintaining an almost constant weight; in fact, the condition is rather of the nature of a slight annoyance than of a serious malady. Mental depression is entirely absent.

The treatment has been general, combined with relief of the constipation, for which latter purpose enemata of warm water, or of a couple of drachms of glycerin, have been found the most satisfactory means. There is, on the whole, some tendency to improvement, but it is only slight.

The characteristic membranes must, however, be referred to more at length. At the beginning of an attack they come with the fæces, and are of small size, but later they are larger, and the greater part follows the fæcal discharge in a mass which may almost equal the latter, being at times as much as, say, a small tumblerful in quantity. The individual pieces vary both in size and consistence, and the following have been observed, the first three appearing to be stages in the development of the fully-formed structure—(1) A soft translucent gelatinous mass, colourless, several inches in length and ¼ in. to ½ in. in thickness, in which particles of fæces, whitish masses, and gas bubbles may be embedded. (2) Somewhat similar masses, becoming inspissated at the core especially, and showing longitudinal ridges, seemingly from shrinkage. (3) Still firmer pieces, with very marked longitudinal ridges. (4) Fully-formed membranes, the most typical perhaps consisting of a band of firm fibrous-looking material, brown in colour, and showing secondary longitudinal ridges, from the edges of which a delicate film of mucus may project for a varying distance. Sometimes a layer of fresh gelatinous material is laid down on one side of a fibrous membrane, at others the fully-formed structure consists of hard brown anastomosing cords, in which fæcal masses may be embedded. (5) In addition to the above, there occur also thin films, some about an inch square, or in elongated strips, smooth on one side, but slightly shaggy on the other, the shagginess being possibly due to small processes originally formed in the interior of glands. The shaggy side is sometimes ridged. Lastly, thin white strips resembling pieces of tænia are observed, and may be an earlier stage of the films. In size the membranes vary from mere shreds to 6 in. or a foot in length, and they may be from about a half to 1 in. in width. No complete tubes have been seen. They consist almost entirely of mucus, the whole membrane appearing to coagulate with acetic acid; but under the microscope the mucous matrix is found to contain embedded in it a very large number of more or less degenerated cells, mostly from the cylindrical epithelium of the gut, but also round cells, of which some are probably leucocytes. Nuclei (free, or surrounded by a very scanty amount of protoplasm), fatty detritus, fatty acid crystals, and great masses of bacteria, have also been observed. Whether any filaments of fibrin are present, or whether, as Hale White[1] asserts to be always the case, the membranes consist solely of mucus, is difficult to decide with certainty, as in sections stained by Weigert's method the mucus is found to retain the dye; but the study of such and other preparations shows at all events that if there is any fibrin present it must be in very small quantity.

The points of peculiarity in this case to which special attention may be called are—(1) The sex of the patient; (2) the persistence of the condition; (3) the absence of pain in defæcation; (4) the absence of mental depression; (5) the excellent state of the patient's nutrition; and (6) the mode of discharge of the membranes, *i.e.*, after the fæces, instead of before, as is usually the case.

The precise pathology of this uncommon condition does not seem to be fully understood. The abundant desquamation of epithelial cells, combined with the mucous secretion, and the undoubted presence of fibrin in some instances, as vouched for by von Jaksch and others, seem to indicate an inflammation varying in intensity in different cases. Constipation is an almost, if not quite, invariable concomitant, and it is known to be capable of causing the condition—as in a case of intestinal stricture, mentioned by Dr. J. P. Doyle, in which inflammatory changes above the constriction were found after death—so that this is almost certainly the exciting cause, at least in the majority of cases, and was probably so in the present instance. Here the unusual absence of pain is no doubt partly due to the care taken by the patient to secure a daily evacuation, but it also goes with the comparatively small amount of membranes passed, and with the unimpaired nutrition, to show that the inflammation can be of no great intensity, nor the area affected of any great extent. Considering the localised pressure symptom mentioned above, I am inclined to think that there is a patch of chronic inflammation in the region of the hepatic flexure, but whether connected in any way with the slight enlargement of the liver (which appears to cause no symptoms whatever), and if so, how, it is impossible to say. The immediate cause of the exacerbations is also difficult to determine, but as certain dyspeptic symptoms always precede the discharge of membranes, it is not unlikely that some slight disorder of digestion may be sufficient to irritate the inflammation into greater activity, though it is strange that even varieties of food ordinarily considered difficult of assimilation do not produce any invariable result. Birch-Hirschfeld's statement,[1] that the membranes develop in the folds of the large intestine when the latter is contracted, so that its dilatation sets them free, perhaps gains some support from the fact that sometimes, although a little fæcal matter would come away with a glycerin injection, no membranes appeared until water was used, when a quantity would be evacuated.

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[1] Allbutt's "System of Medicine," vol. iii. p. 944.

PERSISTENT PRIAPISM, FROM THROMBOSIS OF THE CORPORA CAVERNOSA.

By F. Parkes Weber, M.D., F.R.C.P. (Lond.), *Physician to the German Hospital, Dalston.*

The following case of persistent priapism (lasting over four weeks) is distinguished from some other cases which have been described, in that it was not associated with leukæmia, gout, or (apparent) injury. I have no doubt, however, that in this case, as in the cases associated with leukæmia, gout, or injury, the persistent erection of the penis was primarily of local vascular, not of nervous origin.

Case 1.—The patient, a German baker, æt. 46, was admitted under my care at the German Hospital, 19th April 1898. The history was that two days previously (17th April) he awoke at 4 a.m. with an erection of the penis (quite an unusual occurrence in his recollection). He remained in bed till eight o'clock, but the priapism did not disappear. He then got up and dressed himself, in spite of the inconvenience of getting about in his ordinary clothes. He felt pain in the penis, and the organ, he thinks, gradually increased in size. There was total absence of "libido sexualis." He had had no sexual intercourse during the preceding two weeks.

Past history.—Had had a chancre on the penis twelve years ago.

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[1] "Lehrbuch d. path. Anat.," Bd. ii. S. 669.

Gonorrhœa many years ago. Though rather subject to cough, he has enjoyed average health. Has been moderate in the use of alcohol. Has never previously had an attack of thrombosis in any part of his body. No history of gout or saturnism. Patient has had a certain amount of ozæna, probably since at least twenty years ago.

Condition in the hospital.—The patient is a rather sallow-looking man, rather below the normal in general nutrition. There is no evidence of gout or saturnism, nor are there any signs of active syphilis. On examination of the local complaint the penis was found to be erect, hard, and somewhat tender. No knots or lumps could be felt in the organ. No smegma preputii noticed. No urethral discharge, and no disease of the testicles or spermatic cord. On more careful examination of the penis it was found that the corpora cavernosa were alone concerned in the erection; they felt hard, as if they had been injected with plaster of Paris, whereas the corpus spongiosum and glans penis and vena dorsalis penis were all soft. The urine, soon after admission, was moderately acid, had a specific gravity of 1018, and contained no albumin or sugar. The bowels were rather confined. Nothing noteworthy found on examination of the thoracic and abdominal organs. No fever. On 1st May, the blood was examined by one of the resident medical officers, Dr. Krieg, who found that the hæmoglobin amounted to 90 per cent. of the normal; by microscopic examination he could detect nothing abnormal.

Treatment and progress of the case.—The main treatment consisted in rest in bed, the prevention of pressure from the bedclothes, fomentations of lead lotion to the affected part, and the use of iodide of potassium internally (10 grs. of the iodide with bicarbonate of sodium three times a day). The bowels were regulated with castor-oil. Later on, quinine and iron were given as a tonic. On 9th May the first decided improvement was noted. The proximal (pubic) portions of the corpora cavernosa were definitely softer and somewhat flexible. On 16th May the whole penis was much smaller, but there was still a little pain. On 19th May the penis was nearly natural again. On 23rd May the whole penis was quite flexible, and looked normal, but the corpora cavernosa still felt somewhat hard. This relative hardness was still observed when the patient was examined among the out-patients on 7th June; in other respects the man was well again. The affection had left no distinct knots or lumps (localised sclerosis of the corpora cavernosa).

In the present case the priapism was obviously not of nervous origin, either reflexly (from irritation of a vesical calculus, very acid urine, urethritis, etc.) or from disease of the central nervous system itself. If the disease had been nervous, we should not have found that the corpora cavernosa were the only parts involved in the erection. Moreover, in injuries and diseases of the central nervous system, when priapism forms a clinical feature of the case, the erection of the penis is often only intermittent. In nervous cases an intermittent priapism may be excited by the least recurrent irritation, such as movements of the bedclothes, the passage of a catheter, or any friction to the skin of the thigh.

In certain cases it is recorded that a so-called priapism [1] has lasted for very long periods, even years, but probably not without temporary intermittence and remittance (abatement in degree) from time to time.

The hardness of the corpora cavernosus, and the fact that the corpus spongiosum and the glans penis remained soft, pointed to thrombosis being the cause of the affection. The thrombosis might have been spontaneous, and due to the patient's somewhat cachectic condition, or it might have been determined by some slight vascular lesion, caused by the sudden distension of the organ with blood during erection.

As house-physician for Sir Dyce Duckworth, at St. Bartholomew's Hospital, I had the opportunity of seeing a case of persistent priapism, similar to the foregoing one in most respects, but definitely associated with gout.[2]

Case 2.—The priapism lasted fully three weeks. The patient was æt. 42, and had some gouty inheritance. He was a glass-cutter, and in this way suffered from the effects of lead poisoning, and moreover drank a fair amount of malt liquor. Both of these circumstances favoured the development of gout. One morning at 7 A.M. he awoke with pain in the penis, and priapism. On admission to the hospital five days after this, in addition to the priapism there was evidence of actual gout, for the right wrist was tumid, red, and very tender, with some œdema. Sixteen days after the onset of the priapism, the erection began gradually to subside. By the end of the next week the penis had resumed its natural condition.

Sir Dyce Duckworth thought that gouty thrombosis was the cause of the priapism in the last mentioned case. He quotes two striking analogous examples from the literature of the subject. A shoemaker, æt. 45, suffered from annual attacks of gout. After an attack lasting three weeks, the gout suddenly left the feet and attacked the penis, which became erect and extremely painful. The urine contained occasionally small particles of reddish-yellow gravel. After three weeks the penis was free, but gout came on in the right foot and left elbow-joint. In fifteen days all the symptoms disappeared, and the patient made a complete recovery. The other case occurred in the person of a captain in the Royal Navy, æt. about 60. The priapism was complicated by a phimosis (necessitating incision) and by urethritis. The priapism yielded on the fifth day after treatment, with colchicum and alkalies and a farinaceous diet. There were occasional attacks of gout in the right foot. Another similar attack in the penis occurred a year subsequently.

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[1] The term "priapism" is sometimes applied to any morbid tendency to prolonged or painful erections of the penis. It is probable that the cases recorded as priapism of very long duration (a year or more) belong to this intermittent class.

[2] *Vide* Sir Dyce Duckworth, "Case of Gout in the Penis," *Trans. Clin. Soc. London*, 1892, vol. xxv. p. 97.

Persistent priapism has been several times observed in the course of leukæmia, and W. von Leube[1] remarks that as this persistent priapism is altogether so rare a condition it may be allowed some consideration as a symptom of leukæmia. A. H. Ward[2] has recently described an example illustrating this point. The patient was a small, weedy-looking man, and subsequent examination of his blood showed him to be the subject of leukæmia. The erection came on suddenly after getting into bed, and was entirely confined to the corpora cavernosa, whilst the substance of the glans penis and corpus spongiosum could be felt flaccid. Owing to the pain and straining during micturition, a soft catheter had to be used during several days. By the end of the fourth week the priapism was much less, and the penis fell forwards when the man stood up. By the end of the eighth week the penis was almost normal, but one or two indurated masses remained in the crura.

In this case the spleen was much enlarged, and enlarged lymphatic glands could be felt in the groins, axillæ, and sides of the neck. The ratio of white to red corpuscles was given as one to eight, and on another occasion as one to two.

Dr. Ward has tabulated twelve other published cases of priapism, persisting for different periods, varying from nineteen days to seven weeks. The ages of the patients (not mentioned, however, in two cases) ranged from 26 to 55. Of these cases, one at least was complicated, like Dr. Ward's case, with leukæmia, and one had a large spleen from previous intermittent fever. One case is stated to have been complicated by severe hæmoptysis. One case, like Sir Dyce Duckworth's, was associated with gout. In one case there had been a previous attack of prolonged priapism, and in another case two previous attacks. In four cases the condition was started by sexual intercourse, in one case by straining at stool, and in one case by accident. In three cases the condition is said to have been followed by impotence. Dr. Ward also alludes to thirty-two cases of priapism, collected by Mr. G. L. Peabody,[3] six of which were complicated with enlarged spleens.

Many drugs have been employed in cases of persistent priapism, including iodide of potassium, colchicum, calomel, magnesia, bicarbonate of potassium, sulphate of magnesium, other purgatives, opium, bromides, camphor, and chloral. Locally, fomentations of lead lotion, ice, leeches, mercury and belladonna ointment, oleate of morphia, etc., have been applied.

If such cases are all due to thrombosis, as they probably are, the simplest method of treatment, that by rest in bed, must often be almost sufficient in itself. Pain, constipation, and difficult micturition may, however, be troublesome enough to necessitate special measures. Gout, leukæmia, and anæmia, if present, require treatment.

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[1] *Vide* "Spec. Diagnose," Leipzig, 1895, Bd. ii. S. 312.

[2] *Lancet*, London, 1897, vol. i. p. 1143.

[3] "On Persistent Priapism, not connected with Lesion of the Central Nervous System," *New York Med. Journ.*, 1880, vol. xxxi. p. 463.

In some cases of prolonged priapism, probably due to thrombosis, fluctuation in the diseased organ has been stated, as in Dr. Ward's case, to have been temporarily felt. Commencing suppuration is therefore likely to be thought of, and on this supposition the medical man might easily be induced to make an incision to let out the pus. Yet Dr. Ward's case cleared up without any operative interference, and he suggests that this temporary feeling of fluctuation may be accounted for by softening of the clot. Even in Dr. W. H. Crago's case,[1] where localised fluctuation was, for some reason or other, accompanied by rigors, and where there was œdema of the prepuce, no incision was made, and no abscess formation took place. It is noteworthy that out of the three cases collected by Dr. Ward, in which incisions were made, in two suppuration took place.

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[1] *Australian Med. Gaz.*, December 1888, p. 61.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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A System of Medicine by many Writers. Edited by Thomas Clifford Allbutt, M.D., LL.D., etc. Vol. v. London: Macmillan & Co. Ltd. 1898.

The fifth volume of Professor Clifford Allbutt's "System of Medicine," dealing with some diseases of the respiratory and circulatory organs, though published later than either editor or subscribers desired, appears fully to maintain in its matter the excellence of the earlier sections.

The volume opens with an article on bronchitis, a subject important and necessary in a system of medicine like this, but one of which the text-book writer, like the hospital out-patients' physician, is somewhat a-weary. It is treated in as attractive a fashion as the subject admits by Dr. W. Ewart. The same writer proceeds to the more interesting question of bronchiectasis, discussing the varieties and pathology of the disease, and strongly recommending treatment by inhalation of creasote vapours, as well as by other measures.

Dr. Pye Smith follows with a good summary of the views entertained at the present time on pneumonia, to which he adds freshness and interest by an analysis of 434 recent cases.

The important subject of pulmonary phthisis is fully discussed by Dr. Percy Kidd in some eighty-six pages. The pathology of tubercle in general having been dealt with in an earlier volume, Dr. Kidd is able to devote all his space to the respiratory affection. He gives an excellent résumé of the more important observations of English and foreign authorities on the disease, and on treatment. After a short article on pneumoconiosis by Dr. Arlidge, the interesting subject of pulmonary aspergillosis is discussed by Dr. Rolleston. The disease is rarely met with either in practice or text-book, but it has a special interest to all Edinburgh men from the fact that Professor Hughes Bennett was probably the first man who observed it, as early as the year 1842, but nearly half a century elapsed before recognition of the disease became at all general, though Sir W. Gairdner wrote a valuable paper on it for this *Journal* in the year 1853.

Dr. Goodhart's excellent article on asthma and hay fever is devoted almost solely to the former; the present writer regrets that so little space is given to hay fever, for there seems to be reason for the opinion that the disease is becoming more common and more important to the practitioner than it used to be. The cause may be that education and modern habits of life render our nervous systems susceptible to the effect of stimuli, acting on respiratory membranes, which influenza epidemics have caused to be abnormally irritable.

Dr. S. Gee, with help from Dr. Herringham as regards morbid anatomy, gives an excellent account of pleurisy and empyema, with valuable practical hints regarding the treatment of both. Professor Finlay brings the respiratory section of the volume to a close by a short but valuable paper on pneumothorax.

The circulatory section of the volume contains two valuable physiological papers by Professors Foster and Sherrington, dealing with the general features of the blood and with cardiac physics. At the present time the inclusion of such articles in a work of medicine is not without warrant, for unfortunately physiological teaching in too many of our schools tends somewhat to forsake those practical departments of the science which bear directly upon the work of the physician and surgeon, and to dwell rather on abstruse and recondite branches, which have no such utility, but are mainly of interest to the pure physiologist.

In the article on chlorosis, among much that is excellent, the editor seems to lay too little stress on the rôle of imperfect digestion and assimilation (due to bad teeth, errors in diet, and especially the drinking of strong and long-stewed infusions of Indian tea) as causes of the disease. If the writer of this notice, who has treated many hundreds of these cases, is sure of anything, he is sure that the use of bismuth and soda is of great value in subduing the gastric pain and irritation which exists so often, prior to the administration of iron; also, that in such cases care must be taken to order a diet that will be easily and quickly digested, during the earlier stages of treatment. The editor, on the contrary, insists on a meat diet from the first, and abundance of iron. Both are excellent, if the unfortunate stomach can assimilate them, but distinctly prejudicial if it cannot.

Dr. Sidney Coupland's paper on pernicious anæmia contains a history of the investigations into that mysterious disease, from the time of Addison onwards, and a full statement of the clinical and pathological data thus far attained. How incomplete and unsatisfactory, from a clinician's point of view, our present knowledge remains, every one who has treated cases of the disease is only too well aware. Nor is this the only blood disease in regard to which we are needing more light. Hæmoglobinuria, described in this volume by Dr. S. M. Copeman, presents many curious problems. The question why, under the influence of cold, so rapid a solution of red corpuscles should occasionally occur is almost as mysterious as the speed with which restoration of the normal condition often follows. The article on leucocythæmia by Dr. R. Muir makes one feel how complex is the whole question of blood formation.

Dr. F. T. Roberts contributes a comprehensive article on diseases of the pericardium. The outline drawings, showing dulness in pericardial effusion (after Ewart), differ somewhat from one's own experience, in the narrowness of the dull area at the base, and the breadth at the apex, as given by him.

The editor's article on functional disorders of the heart is full of suggestiveness. His wide range of vocabulary, facility in illustration, and clearness of statement, render the article not only instructive, but attractive to the reader.

Speaking of the causation of irritable heart in young adults, Dr. Allbutt writes: "Is it with laughter or with tears that one looks back on the reckless forenoon breakfasts, washed down with those detestable compounds called 'cups'; the sherry and half a box of mixed biscuits at luncheon; the manly absorption of grown-up, and more than grown-up, doses of tobacco; the black coffee and cognac of an evening, after a large gobbled-up dinner; the hot arguments on the framework of the universe and the destiny of man, protracted till two in the morning; the spasmodic bouts of study; the examination bogie; the conflict with untamed and rebellious passions; . . . the violent games and bear fights; the ardent hopes and the bitter griefs. . . . That is no priggish advice which would cut out of this gay, ardent, and careless life some of the idler and less lovely follies; . . . not violent stress one day, and idleness, not unmixed with dissipation, on the next, but regular training, which shall promote a uniform development, not only of lungs and heart, but also of all the parts of body and mind."

The editor further contributes valuable articles on mechanical strain and on diseases of the aortic area. A paper on injuries by high pressure electric currents, by Dr. Oliver (a topic of rapidly increasing importance), articles on simple and infective endocarditis, by Dr. Dreschfeld, and on diseases of the mitral valve, by Dr. Sansom, complete this fifth instalment of a System of Medicine, which has already taken a high place in English medical literature—a place fully maintained, if not indeed further raised, by the excellence of the volume we have been discussing. R. CATON.

Manual of Static Electricity in X-ray and Therapeutic Uses. By S. H. MONELL, M.D. William Beverley Harison, New York, 3 and 5 West Eighteenth Street. 1897.

THIS is the second edition of a book which has been called for within three months of the first publication. The author makes the statement that "many who employ no electrical apparatus themselves, have found it useful to become acquainted with the actions of a remedy of which they before knew little. Moreover, every physician now desires the facts which my book gives about X-rays." It will be seen from this that Dr. Monell aims at placing an intelligent guide before the medical profession, and one which will cover, not only the old and more familiar therapeutic methods, but also the most recent discoveries in connection with Röntgen's work. It may at once be said that one of the principal points in the latter is the question of how far the static machine may be found useful in exciting X-ray tubes. Dr. Monell tells us he was at first sceptical of the advantages of the influence machine as compared with the induction coil or other transformers, but he is now thoroughly convinced of its superiority. Considering the evidence which has been brought forward by the greatest authority on influence machines, Mr. Wimshurst, and by Lord Blythswood and others, no one can now doubt that the influence machine has a distinct place amongst the exciters of

Crookes' tubes. Each method has its advantages and disadvantages, but with this question we are not at present concerned. What we are more particularly interested in is to show how far Dr. Monell has succeeded in convincing his readers, that the static machine he recommends, and his methods, are likely to prove valuable to the medical profession. Doubtless, the discovery of the X-rays will induce many others, as the author points out, to go in for an apparatus which will produce X-rays, and, if required, also be useful for therapeutic purposes. It is, therefore, of importance that such a work should place the most reliable and recent information before the profession. Judged from this standpoint, we regret to say that in many ways the work might be improved.

In the first place, Dr. Monell recommends the Holtz machine. On this side of the Atlantic at least, we are inclined to look upon the Wimshurst machine as the most advanced and reliable instrument. These machines have now been so long in use that there can be no doubt, from the smallest influence machine of any practical value to the physician, to the enormously powerful apparatus of 160 plates constructed by Lord Blythswood, there is but one verdict.

Dr. Monell devotes a considerable amount of time to pointing out how the influence machine has suffered by people not understanding its proper use, and believes that the so-called difficulties in obtaining discharges have arisen from the fact that they do not know how these may be overcome. We do not wonder at some loss of interest, if the description of Dr. Monell's own apparatus be correct. On page 24 he says, dealing with the difficulties in starting and working the Holtz machine, "no cripple is more helpless than such a machine without its charge." It is, to quote his own words, "like a rifle without a charge." He then proceeds to give most careful directions about the room being kept dry, the employment of dishes containing 10 lb. chloride of calcium, and also the addition of a Wimshurst charger occasionally, but with all these he has seen half an hour used in obtaining excitation.

Further, the machine occasionally changes its polarity. To correct the latter, Dr. Monell recommends a sharp jar to the machine, such as lifting and dropping one end of the glass case upon the floor, or a few sharp taps with a hammer on the outer end of the brass cross-bar which supports the combs. We have also a method described for discharging a Holtz machine, which, if not successful, is to be tried again. Workers with a good Wimshurst machine will read such statements with surprise. Here we are accustomed with a good machine to look for excitation before the handle has completed its first revolution. Change in polarity, when the machine is once started, we never expect, and these, with many other advantages, may be obtained without any great drying precautions, whether in the room itself or chemically by chloride of calcium, as recommended by Dr. Monell. We have had experience of Wimshurst machines, which have been in use for eight or ten years, and they are as good as ever, possessing none of the disadvantages above referred to. One is inclined, moreover, to ask how an enormous machine, like that of Lord Blythswood, which requires a building for itself, could be lifted and dropped upon the floor, if construction were not now more advanced than described by the author of this work.

The work, however, is not without its value. On the contrary its scope, including as it does the therapeutic uses of static electricity, includes the methods employed in a great many diseases, the history of the subject, and the careful collection of reports of many workers in this department since the days of Cavallo. Amongst the latter will be found the reports of Addison, Golding Bird, Hughes, Sir William Gull, and Arthuis of Paris.

The medical profession has hitherto been largely divided into two great classes upon the value of electricity; on the one hand, those who have been somewhat over-enthusiastic about its use, and on the other those who have been too sceptical. That the work will prove useful in many respects to those desirous of obtaining information, on these and many other questions in a wide and important subject, we have not the slightest doubt. Nevertheless, in view of the serious questions involved, we must state our opinion that, both in apparatus and methods, there is room for correction and improvement in future editions.

J. MacIntyre.

Tablets of Anatomy. By Thomas Cooke, F.R.C.S., and F. G. Hamilton Cooke. Eleventh edition. London: Longmans, Green & Co. 1898.

This edition of the "Tablets of Anatomy" is published in three parts, and is profusely illustrated by figures taken from standard text-books and by a number of diagrams specially prepared for the authors. The feature of the new edition, however, is the introduction of notes, printed on a different kind of paper from that of the ordinary tablets. These notes contain "new facts,—or supposed facts,—not plainly discernible,—statements based upon a theory,"—while the "anatomy of the medical man . . . that can be seen and handled by all," is presented in the tablets themselves. There are doubtless many students who like to have anatomy presented in a concentrated form, and to have in a few pages of printed matter the most essential facts which must be learnt for examination. For such students Cooke's tablets seem to have been an ideal book, but one can hardly imagine anyone who is beyond the cares of examinations making use of even the present edition as a book of reference, in preference to the numerous scientifically arranged text-books of anatomy. The tablets have now become, by the introduction of these notes and illustrations, as bulky and almost as costly as many complete text-books, and Mr. Cooke has introduced, under protest however, a more than full proportion of what he is pleased to call "paper anatomy." This is in many places enlivened by the author's candid criticisms of the various descriptions which he copies from different authorities, and by the introduction of allegories and short dissecting-room tales.

In some cases Mr. Cooke himself is not above possessing "views" which are, we notice, not necessarily those set forth in the "Old Anatomy." For instance, under "surgical fasciæ" (p. 108 *m*, Part ii.) we are told that the difference in strength of the fascia covering the anterior and posterior parts of the gluteus medius muscle depends on the fact that the anterior part of the muscle "receives the full outside pressure," while the posterior part is covered by the gluteus maximus, and protected. Equally unorthodox views are given concerning the causes in the differences in the strength of the fascia iliaca and fascia transversalis.

The erratic manner in which some parts of the subject are distributed throughout the book, and the absence of a complete index, are serious drawbacks to the work. One cannot help regretting that in making such extensive alterations in this last edition Mr. Cooke has devoted so much energy to such notes as he has introduced—containing as they do matter which he himself apparently considers to be of only secondary importance—rather than to the greater expansion and more uniform development of the original tablets, which are doubtless of much assistance to students when rapidly revising their anatomy.

A. Francis Dixon.

A Pictorial Atlas of Skin Diseases and Syphilitic Affections, from Models in the Museum of the Saint Louis Hospital, Paris, with Explanatory Woodcuts and Text. Edited and Annotated by J. J. Pringle, M.B., F.R.C.P. London: The Rebman Publishing Co. Ltd. 1897.

This Atlas, of which the concluding part and the index have recently appeared, differs in two essential particulars from others covering much the same ground. One, that the plates are reproduced, not from the life, but from the famous series of models by Baretta and Meheux, constantly receiving additions, which form such an attractive adjunct to the Saint Louis Hospital. The other, that the letterpress which accompanies each is not merely a description of the picture, but is a carefully elaborated essay from the pen of one or another of the staff, whose wide experience enables them to speak *ex cathedrâ.* In a work where such a high and uniform standard of excellence is attained, it is difficult for a reviewer to select, yet it is his duty to convey to his readers some idea of the nature of the illustrations and of the scope of the text. Thus two plates, embracing seven figures, are devoted to lupus pernio, a rare and strange compound of cyanosis and tuberculosis. Besnier and Tenneson furnish exhaustive accounts of the ailment, in which the dusky bluish tint serves to obscure the characteristic lupus nodules. It apparently resembles, but is not identical with, the chilblain lupus of Hutchinson. Sabouraud treats of agminate trichophytic folliculitis, an agglomeration of intradermic pustules in patches, a kerion, in fact, of surfaces provided with lanugo hairs, but the direct connection of which with the trichophyton has only recently been established. Two admirable delineations enable Jacquet to formulate the distinction between squamous eczema of the palm and syphilitic hyperkeratosis of an analogous region, the sole. Erythema iris, well depicted, is made the subject of an article by the lamented and heroic Henri Feulard, and is a good specimen of his clear and incisive style; while Du Castel, dealing with the same topic, directs attention to the somewhat puzzling manner in which the mucous membrane of the lips and mouth may be involved in this affection, and the possibility of error thereby arising. Hallopeau minutely investigates the lichen planus of Wilson, and Fournier gives the contrast representation of the lichenoid and miliary forms of the polymorphous syphilides. Rarer diseases are also included, such as Biskra button, or Oriental boil, by Jacquet; Paget's disease by Darier, who is now less certain of the nature of the peculiar bodies found in this complaint, presumably valuable from the diagnostic side; and xeroderma pigmentosum, from a case in which the ordinary and intrinsic initial lesions are very little pronounced, though the ultimate carcinomatous development has already reached considerable proportions, an indication that it is not the amount but the essential nature of the disease which leads up to this. Syphilis occupies considerable space in the Atlas. There are eight forms of chancre represented in the parts under review, but these are far from comprising all the variations, which Fournier describes with painstaking accuracy. Most of the other pictures of specific disease are drawn from the tertiary period, that in which diagnosis is most difficult, there being so little collateral evidence to aid in discriminating. Thus the pigmentary, the rupioid, and the gangrenous syphilides all find a place, while in comparison may be set an aggravated form of bromide eruption of ulcerated type, where death resulted from cachexia, dependent to a large extent on ungrounded syphilophobia. It is hard to overestimate the value of this Atlas, perhaps as much from what it suggests as from what it contains. We congratulate Dr. Pringle, not only on his admirable rendering of the original, but also on the very useful annotations which he has appended to many of the articles, in some cases quoting other sources of information, in others throwing additional light on obscure points. Were one to be hypercritical it might be objected that *criblé* would in some passages be better translated by "closely set," than by the literal "riddled."

W. Allan Jamieson.

Chavasse's *Advice to a Wife*. Fourteenth Edition. By Fancourt Barnes, M.D. And *Advice to a Mother*. Fifteenth Edition. By George Carpenter, M.D. London: J. & A. Churchill. 1898.

These immensely popular household books have been issued, as revised by Dr. Fancourt Barnes and Dr. George Carpenter respectively. The publishers are to be congratulated on acquiring such well-known authorities to undertake this onerous task, as the responsibility of popularising subjects of such immense importance is extremely great. In both volumes the colloquial style of the author has been left unchanged, and his plain speaking on home truths is happily left unaltered. A large amount of revision has been done by Carpenter in the *Advice to a Mother*, and the information contained brought well up to date. It would have been preferable, however, had all technical prescriptions been expunged, as home prescribing is but too apt to rest on the fatal error of mistaken diagnosis, and much valuable time thus lost in the proper treatment of a given case.

In *Advice to a Wife*, Dr. Barnes has unfortunately adopted the author's previous method of calculation of the date of confinement as 283 days from the last day of the last "period," which is contrary to medical teaching, which shows it to be 280 days from the first day of the last period. By this the calculation of the medical attendant is apt to be controverted by the lay reader, and we are afraid if adhered to, the unfortunate mother may frequently find herself without a nurse, and her household arrangements prematurely upset.

It would have been well, also, had he been more strict in his antiseptics, the ablution of the parts "with a sponge" is undoubtedly dangerous, while vaginal douching or syringing is a hazardous routine. On the whole, however, the reviser is to be congratulated on the satisfactory completion of his task, and doubtless the book will prove useful in the future as it has in the past. F. W. N. Haultain.

Le Torticolis et son traitement. Dr. P. Redard, Chirurgien en chef du Dispensaire, Furtado-Heine. Paris: Carré et Naud. 1898.

This attractive volume may be consulted as a monograph on the subject of wry-neck. Everything which has been written on the subject has been noted and carefully digested. The author's individual experience is considerable, and has been abundantly utilised, especially in the direction of providing a large series of excellent photographs of the deformity in question, which are among the best we have seen. It is written and arranged on the usual systematic plan of French monographs. The author believes in a form of wry-neck which is truly congenital. Rupture of the sterno-mastoid at birth is regarded as being very rarely followed by muscular contraction, or by a permanent torticollis, which at all resembles the congenital form. In spasmodic wry-neck, the seat of the lesion is placed in the cortical centre for the rotatory movements of the head. The asymmetry of the face and head observed in congenital cases is ascribed to the same influences obtaining during intrauterine life, which lead to the deformity itself. The chapter on diagnosis is an especially valuable one; excellent rules are laid down for differentiating between cases in which the deformity is of muscular origin, and those in which it arises from articular or osseous lesions of the spine. In the treatment of the common congenital form, the author selects the third year as the best time for operation, and is in favour of the open method of division of the shortened structures in the majority of cases. The cervical scoliosis should be corrected as soon as the tenotomy is completed, while, in the after-treatment, massage and gymnastic exercises are regarded as likely to yield greater service than any form of complicated apparatus. The total excision of the contracted sterno-mastoid, practised by Mikulicz, is to be reserved for very exceptional cases, which resist other methods of treatment. The different procedures applicable to spasmodic cases are very fully considered, and include a description of the method by open myotomy, as practised so successfully by Kocher. The list of works and papers quoted in the volume extends to twenty-three pages. There is no index. Alexis Thomson.

Transactions of the American Surgical Association. Vol. xv. Philadelphia. 1897.

This large volume contains the twenty-five papers read at the meeting of the Association held on the 4th, 5th, and 6th May. The amount of work compressed into these three days strikes the English reader as enormous, and fills him with admiration for the energy of his American confrères. The papers are, as is always the case, of very unequal merit. Some are admirable; others, it must be admitted, rather tedious, but taken as a whole the volume is a credit to American surgery, and contains much of real interest. In a review of the *Transactions* it is impossible to notice each individual paper. From the many we may select three: (*a*) "The Presidential Address," by J. Collins Warren; (*b*) "The Röntgen Rays in Surgery," by J. William White; and (*c*) a lengthy contribution of 100 pages on "The Surgical Treatment of Congenital Ano-rectal Imperforation, with a Personal Experience of Kraske's Operation in this Condition," by Rudolph Matas.

The presidential address on "The Influence of Anæsthesia on the Surgery of the Nineteenth Century," by J. Collins Warren, M.D., LL.D., is a fascinating, scholarly, and instructive chapter by one whose relatives, John C. Warren and J. Mason Warren, were pioneers of anæsthesia fifty years ago.

Of great interest is the able paper on "The Röntgen Rays in Surgery," by the well-known surgical author, J. William White. It contains a résumé of all that is known on the subject. The author is, however, possibly a little too confident in his anticipations: thus he does not regard the difficulties of skiagraphing a fracture of the base of the skull as insuperable; he expects that ureteral stone will be *easy* of recognition, and he has hopes that the trophic changes produced by X-rays may serve a useful therapeutic purpose in inoperable cases of keloid, in capillary nævus, hairy moles, and analogous cases, not adapted to removal by the knife, or amenable to other well-established surgical procedures. Experiments have been carried on by the author in cases of cancer, and although Dr. White admits he has no results to report, he is determined to continue his experiments until convinced that they are useless.

The voluminous paper by Rudolph Matas contains twenty conclusions, with the first and most important of which most surgeons will agree: "The most prevalent varieties of congenital ano-rectal anomalies, especially the types of imperforation, which most urgently call for surgical relief, are amenable to successful treatment by the perineal route. The cases that would justify primary colostomy are in the minority."

HERBERT F. WATERHOUSE.

Transactions of the American Orthopædic Association. Vol. x. Published by the Association. 1897.

THIS volume contains thirty-two papers by various authors, most of which are short, clear, and practical, but none call for any special notice.

R. Whitman contributes a paper, illustrated by two excellent skiagrams, on fracture of the neck of the femur in childhood, with special reference to its diagnosis and to its more remote results, in which ten cases of the accident are recorded. Under the misleading title of "The Direct Transplantation of Muscles in the Treatment of Paralytic Deformities," J. E. Goldthwait describes a procedure in which the tendon of the sartorius is implanted into the quadriceps extensor tendon in the not infrequent cases in which the former muscle retains its function whilst the latter is paralysed. The method seems well worthy of further trial.

E. H. Bradford has an instructive and suggestive paper on the human gait which will well repay perusal. HERBERT F. WATERHOUSE.

RECENT ADVANCES IN MEDICAL SCIENCE.

◆

MEDICINE.

UNDER THE CHARGE OF

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Clinical Tests, Methods, and Signs: The Heart—(*continued*).

2. New Instruments.

A new binaural stethoscope is figured and described by Knopf (*Am. Journ. Med. Sc.*, Phila., January 1898). It is quite certain that the continual and frequent use of the ordinary binaural stethoscope often affects injuriously the auditory powers of its possessor, owing to the irritation arising from the pressure of the ear-tips. Knopf has adopted a form of the binaural instrument which is supplied with ear-pieces, very similar to the proximal disc of the single stethoscope, adjusted to the head by a light steel head-spring, and connected by light indiarubber tubes with coiled wire inside them, from openings in the centres to the chest-piece. The concave ear-pieces are joined to the head-band and conducting tubes by ball-and-socket joints.

Such is the general description of the instrument, but along with it are conjoined several accessory items. Thus the cardiac chest-piece, or bell, can be replaced by a larger one when auscultation of the lungs is practised; an oval form is available for intercostal examination; a soft rubber bell facilitates the auscultation of sensitive chests and of children; while a small instrument attached to the tubes of the stethoscope—from its appearance it consists of a thin tube with a small bell-shaped mouth (no details are given in the text), and which is called the "delineator"—serves to enable the examiner to localise circumscribed phenomena. This delineator may not conduct sounds so loudly as the phonendoscope, but is free from the vibratory noises inseparable from that instrument. A pleximeter is also supplied: one that can be attached to the chest-piece of the stethoscope, retained in position on the chest by removal of air by means of a rubber air-pump, after the manner of a common "sucker"; and which is made with a central portion upon its outer surface, adapted for percussion. When this cup is fixed on to the chest-wall, and attached to the stethoscope, percussion and auscultation can be practised at one and the same time; while another advantage yielded consists in the possibility of several individuals, students for instance, listening successively to the clinical signs over one spot, while the instrument remains attached over it by atmospheric pressure.

Walsh (*Med. Rec.*, N. Y., 21st May 1898) illustrates what is surely a superfluous development of the phonendoscope, whereby two or three or more are enabled to listen simultaneously to the auscultatory sounds, conducted through one instrument by means of a multiplication of the number of ear-pieces.

Basch (*Wien. med. Bl.*, June 1897) contributes some practical hints towards the successful use of his sphygmomanometer. The diagnosis is benefited by the accurate presentation of the blood pressure made by it; the prognosis is rendered less difficult in many cases, especially in cases of fever; while the state of the blood pressure suggests a line of treatment which proves successful.

Heller, Mayer, and v. Schrötter (referred to in *Centralbl. f. innere Med.*, Leipzig, 2nd July 1898) found this sphygmomanometer to be untrustworthy, except when certain precautions have been taken. The figures obtained are only relative.

3. Cardiac Lesions.

In the *Gaz. d. hôp.*, Paris, 1898, Nos. 1 and 2, Bacaloglu reviews the different clinical forms of aortic incompetence, concluding that a diastolic murmur heard over the aortic area is of very variable moment; it may be caused by incompetence following aortic endarteritis, or endocarditic insufficiency. François-Franck, by producing a lesion of the walls of the aorta close to the valve in a dog, caused the development of a typical murmur of incompetence, although the cusps of the valve were normal.

Frank Billings (*Journ. Am. Med. Assoc.*, Chicago, 26th July 1898) sums up the points, which should aid in differentiating between the cardiac incompetency of intrinsic heart disease from that of chronic nephritis, as follows:—"If the urine, even though scant, shows a relatively low specific gravity, with diminished total solids, lessened urea, much albumin, and casts of all varieties. If the arterial fibrosis is marked and the pulse full and sustained, or without arterial thickening if the pulse is sustained. If the dropsical effusion is poor in albumin. If the dropsical effusion contain urea in considerable amount. If there is a tendency to inflammation of serous surfaces, pericarditis and pleuritis especially. If there is a tendency to persistent morning nausea and vomiting of stringy mucus. If there is a tendency to periodic diarrhœa. If there is much headache, especially severe frontal and occipital pain. If there is a tendency at one time to unrest and mental excitement, or at another to somnolence or to coma. If cerebral hæmorrhage occur. If the dyspnœa of exertion becomes of the Cheyne-Stokes type. If severe epigastric pain occur. If the eye ground shows the changes common in albuminuria, and if the patient present a pale, waxy, puffy face and heavy expression, and a general anæmia, the diagnosis is in favour of nephritis. If there is a history of antecedent disease in which endocarditis may have occurred. If the heart shows physical signs of valvular disease with characteristic murmurs. If there is an irregular heart action persistent in character. If the pulse is weak and not sustained with or without arterial fibrosis. If the dyspnœa of exertion is attended with cyanosis. If there is a normal amount of red cells and hæmoglobin, or only a moderate degree of anæmia. If the dropsical effusion begins in the lower extremities, appearing during the day. If the dropsical effusion is relatively rich in albumin. If the dropsical effusion contains relatively little or no urea. If there is much enlargement of the liver, and tenderness of the left lobe. If the urine is scant, of high specific gravity, with much lateritious deposit, little or no albumin, a high percentage of urea, although the total urea of twenty-four hours is deficient, a few casts only, chiefly hyalin or finely granular. If there is little or no headache, no eye ground changes, and if venous thrombosis or embolism occur, the diagnosis is in favour of intrinsic heart disease."

4. THE BLOOD.

JUDSON DALAND (*Phila. Polyclinic*, 4th June 1898), of the three methods for estimating hæmoglobin,—Gowers', Henocque's, and Fleischl's,—prefers the last named. The lancet used should not be too sharp, and the puncture preferably made in the thumb. The chief point referred to by Daland is the greater accuracy obtained if the tube be fitted with a metal cap, having a slit $\frac{1}{8}$ in. wide across it. This corrects the alteration of tint in the solution, due to the distance of one end of the cylinder from the other, by focussing the vision at mid-distance between the ends.

Watkins (*Med. News*, Phila., June 1897) suggests the use of an instrument, called the micromotoscope, for the representation of living microscopic objects, such as blood corpuscles, on a screen. The method, generally, consists in the adaptation of the kinematoscope to the movements of living cells as seen under the microscope; the photographs follow each other at intervals of $\frac{1}{50}$ to $\frac{1}{26}$ of a second. A full record of the expansion and contraction of a leucocyte would require from 800 to 1500 exposures!

Engel (*Berl. klin. Wchnschr.*, 17th May 1898) estimates the alkalinity of the blood in the following way. He fills a capillary tube holding 0·05 c.c. with blood; the tube is divided off with marks into ten equal parts, and expands above into a bulb containing ninety-nine times 0·05 c.c. After dilution of 0·05 c.c. of blood up to 5 c.c. with distilled water, the mixture is expelled into a cover-glass or capsule, and its alkalinity titrated with $\frac{1}{75}$ normal tartaric acid solution (1 grm. in litre) and litmus paper. The litmus paper he recommends for use is of a special light colour. A drop of the mixture, after each successive drop of the acid solution has been added, is allowed to fall on the paper, and when a clear red line shows up round the edge of a drop the end of the reaction has been reached. About eight to ten drops of $\frac{1}{75}$ normal tartaric acid is the mean in healthy adults, or 0·533 alkalinity as NaHO.

Ide (*Medicine*, Detroit, June 1897) praises Hammerschlag's method of estimating the proportion of hæmoglobin present in the blood. This method depends upon the correspondence between the specific gravity of the blood and the percentage of hæmoglobin in it. For instance, blood with a specific gravity of 1033 contains 25 per cent. of hæmoglobin or thereabouts; with a specific gravity of 1040, 40 per cent.; 1050, 65 per cent.; and with 1060, 95 per cent., and so on. The specific gravity of the blood is tested by allowing drops of it to fall into a mixture, formed of equal parts of chloroform and benzol. While the drops rise to the surface more benzol is added, if they sink more chloroform, until a drop remains *in situ*, when the specific gravity of the blood and that of the fluid are equal. This is then ascertained by means of an ordinary hydrometer.

Henocque (*Presse méd.*, Paris, 25th June 1898) in this journal brings forward a method for the examination of the blood, which he terms hæmatoscopy. The method is divisible into two parts; the first consists of a determination of the degree of dilution required to permit of the two spectroscopic bands of oxyhæmoglobin being seen in blood contained in a glass vessel of prismatic form. This is "*hématoscopie*," "*diaphanometrie*" follows. This is simply corroborative of the other, and depends upon the obscuration of letters engraved on discs, the degree of opacity of the fluid being thus determined in confirmation of previous determinations. The second part deals with actual spectroscopic investigation as to the amount of the reduction of oxyhæmoglobin in the skin. A tourniquet is applied round the base of a finger, the spectroscope used directly, and the time which elapses before the first band indicative of oxyhæmoglobin disappears (sixty to seventy seconds in health). Normally, the unit of reduction in the skin is 0·2 per cent. of the oxyhæmoglobin present. A further advance in the spectroscopic examination of the blood in the body can be obtained by the use of the author's chromatic analyser—a spectroscope furnished with a disc carrying several yellow glasses, graduated in depth of tint; and by noting the depth of tint necessary to extinguish the bands of oxyhæmoglobin observed in the skin.

The two difficulties usually met with in the enumeration of blood plates can be best avoided, according to Emden (*Fortschr. d. Med.*, Berlin, July 1898), by the use of Prus's solution—osmium-chromic-acetic acid, by which the red corpuscles can be removed—and the examination of the mixture in the cold, to prevent lumping together of the plates. The fluids should never be shaken. Two hundred and fifty thousand per c.mm. is the normal figure in men.

A suggestion is made by Bremer (*Journ. Am. Med. Assoc.*, Chicago, 9th April 1898) as to the feasibility of making and fixing blood films at the bedside, and at exact temperatures. He has devised a small stove—the one figured was made from an old quinine can—in which a wire tray supported on cross-wires supports the cover-glasses; a thermometer being placed with its bulb on the same level as the tray. A spirit-lamp or gas-jet serves to heat the stove up to 135° C., the temperature he recommends, in from four to six minutes, and the cover-glasses are dried and hardened with the best results.

Stockton (*Phila. Med. Journ.*, 25th June 1898) records a case of relapsing lobar pneumonia in which leucocytosis was absent. Details must be obtained from the original, as also from a paper by Solly on the increase in the number of red blood corpuscles and (more gradual) in the percentage of hæmoglobin (*Phila. Polyclinic*, 2nd July 1898).

SURGERY.

UNDER THE CHARGE OF

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The Treatment of Gonorrhœa with Protargol.

Of the many drugs which have been credited with curative properties in the treatment of gonorrhœa, protargol appears to be one of the few that merits further trial. Dr. Paul Noguès has just published the results which have been obtained at the genito-urinary clinic of the Hôpital Necker in Paris. For the benefit of those who are not familiar with the drug, it may be stated that it is a proteinate of silver, easily soluble, easily kept; it does not give a precipitate with chloride of sodium, and does not coagulate albumin. It is claimed for it, that it is free from any irritating action upon a mucous surface. As recommended by Neisser, the treatment should be inaugurated at the earliest possible stage of the disease. The solution of protargol (0·25 to 1 per cent.) should be injected thrice daily. In the morning and at midday the fluid should be retained five minutes in the urethra; in the evening, thirty minutes. In a few days one need only inject in the evening, and this should be continued for three or four weeks. As it is desirable to introduce a large quantity of the solution, a syringe having a capacity of 10 to 15 c.c. should be employed. The author reports one failure only in fifteen cases. All were examined ten days after all treatment had ceased, and were submitted to the two customary tests, *i.e.*, indulgence in beer, and coitus under "protection." The injections were unattended with any pain. In two cases there developed an epididymitis.—*Ann. d. mal. d. org. génito-urin.*, Paris, June 1898.

Fat Embolism after Forcible Straightening of Contractures.

Rare as fat embolism is, as a sequel of comminuted fractures, it is rarer still after the forcible straightening of deformities; only four authentic instances have been recorded. Dr. Erwin Payr, assistant in Nicoladoni's clinic at Graz, records a fifth, of which the particulars are briefly as follows:—

The patient, a girl of 16, presented a flexion-contracture of the right knee, resulting from an antecedent osteomyelitis of the tibia. The joint was freely bent and then straightened under ether. The operation was followed by much pain and general restlessness, and the next morning by the most profound collapse. The temperature was normal. There was considerable dyspnœa. The patient, although conscious, was very restless, and coughed up a quantity of bloody mucus. In spite of very free stimulation, she died in the afternoon. On examining the body, there was some fluid blood in the right ventricle, with fine droplets of fat floating in it. The veins of the right lower extremity, from the popliteal as high as the vena cava, were filled with blood, partly clotted and partly fluid, the latter mixed with fat droplets, easily recognisable with the naked eye. Similar blood was found in the right knee-joint. There was no fracture of either of the component bones. The cortex of the bones was thin, and the spongiosa so soft that it was easily indented with the finger. The lungs, examined microscopically, showed an extreme degree of fat embolism. The lymph-follicular tissue in thymus, spleen, lymphatic glands, and tonsils, was much increased in amount.—*München. med. Wchnschr.*, 12th July 1898.

Gonorrhœal Inflammations of Joints.

Mühsam reports on forty-one cases treated in the Moabit Hospital in Berlin. In thirty, the affection was monoarticular; in the others, several joints were affected. Fifteen recovered with complete mobility, twelve were improved; that is to say, the joint effusion readily relapsed; seven resulted in ankylosis; in three the affected joint had to be resected; amputation of the thigh was required in one case, on account of suppuration in the knee-joint; one died with symptoms of sepsis six weeks after the commencement of the gonorrhœa; both wrists and one ankle were affected; nothing characteristic was found on post-mortem examination. Although always looked for, the gonococcus was only found in the joint effusion in four cases. As regards treatment, absolute immobilisation is the most satisfactory; where there is effusion into the joint, the latter may be punctured and irrigated.—*Centralbl. f. Chir.*, Leipzig, 30th July 1898.

Traumatic Tetanus, Treated and Cured by Intracerebral Injection of Antitoxin.

MM. Chauffard and Quénu have adopted the intracerebral injection of antitoxin for the first time in the human subject. The case was a severe one, judging from the acceleration of the pulse, 120 to 130, and the intensity of the muscular contractions of the jaws, face, and trunk. The injection was made on the fifth day (of the disease?). A small trephine hole was made, so that the injection penetrated the lower end of the second frontal convolution, thus avoiding the psycho-motor centres, and at the same time allowing the antitoxin to reach the latter by diffusion. For the first six days following the operation, the tetanic symptoms did not undergo any alteration; there was cerebral excitement with mild delirium and insomnia; the heart's action continued at the same rate as before the operation. On the seventh day the patient slept quietly for the first time, during the greater part of the night. Two days later, there was sufficient improvement in all the symptoms to make one hopeful of recovery. Seventeen days after the operation, he could open his mouth and masticate food. His ultimate recovery was complete.

The course of events observed in this case corresponds exactly with that observed experimentally by Roux and Borrel; the contractures existing at the time of injection continued, and only disappeared very gradually as the action of the toxins became exhausted, but there was no extension of the process to fresh nerve-centres. The jaws, face, and trunk, were involved before the injection; the limbs remained free.

In congratulating the authors upon the success which attended this more direct method of employing tetanus antitoxin, it is to be borne in mind that the success is also contributed to by the relatively slow progress of the disease in this case and the comparatively early stage at which the antitoxin was injected.—*Gaz. d. hôp.*, Paris, 28th June 1898.

The Creation of New Joints between Bones which are Normally Independent.

In a recent communication to the French Academy of Science, Professor Ollier of Lyons lays down the principles upon which a new joint may be created between bones which are normally independent or which, at anyrate, do not articulate with each other. By fixing the bones to each other, and in preserving not only the tissues which will assure their union but also the remains of any muscles which functionated upon the joint which has been lost or destroyed, one may obtain a new joint, surrounded by muscles which may confer upon it active functions. In a recent case, Ollier attached the upper end of the decapitated humerus to the outer end of the clavicle, and succeeded in restoring the functions of the upper arm. The head of the humerus and the entire scapula had been lost, as the result of a gunshot injury sustained at the siege of Metz in 1870. The upper limb was only connected to the trunk by soft parts, the upper arm hung useless by the side. The outer end of the clavicle was dragged upwards by the trapezius, and had lost all relationship with the humerus. There was a depressed gap between it and the upper end of the humerus, which measured 8 cms. In spite of a special apparatus supporting the elbow, and fixing it against the trunk, the patient could not undertake any manual occupation. The operation was performed by Ollier on the 23rd December 1893. The adjacent ends of the clavicle and humerus were bared of periosteum, the latter being preserved. The bones were fixed to each other by two platinum wires, which were left *in situ*. A fibrous ankylosis resulted, with considerable movement in all directions, but especially free in the antero-posterior plane. Special attention was paid at the operation to the reconstruction of the muscular attachments; the deltoid was disengaged from its cicatricial connections, and was sutured to the trapezius at several points, so as to form a digastric muscle. The other muscles were similarly dealt with, so as to reproduce around the new joint a muscular system, as nearly like that of the original shoulder-joint as possible. The wound healed under one dressing. The limb was immobilised by a plaster bandage for four months. Although at first very stiff and useless, the joint now enjoys a very free range of movement. The bones are so well fixed to each other that the patient can lift weights from the ground with the same facility as with the opposite limb, and can abduct the upper arm at the shoulder with considerable energy. The clavicle is no longer dragged upwards, but lies in the same plane as the corresponding bone on the left side. Since the operation, the patient no longer uses his complicated apparatus, and is able to use his arm for all ordinary purposes.—*Gaz. d. hôp.*, Paris, 13th June 1898.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Vesico-Uterine Fistula.

Rudolph Lavor (*Centralbl. f. Gynäk.*, Leipzig, December 1897) records a case of vesico-uterine fistula. The patient was delivered in 1892 of her first child by Cæsarean section, and the wound in the uterus was closed with silk sutures. In January 1897 she became pregnant again, and labour pains commenced at the end of August. She was a weak, poorly developed woman, with a rachitic pelvis, whose conjugate diameter was 7·5 cms. She had dyspnœa, increased temperature and pulse, and coarse râles in the chest; the urine was ammoniacal, and contained albumin, but no blood. As her condition was alarming, labour was induced by puncture of the membranes. A small dead fœtus was born two days later, the urine was then found to contain blood. The patient died about an hour and a half after childbirth. At the post-mortem there was found endometritis, the bladder was adherent to the uterus at the lower part of the incision made at the section. There was a vesico-uterine fistula at the site of the lowest silk suture, which was open and lined with decidual membrane. There was chronic cystitis, and the bladder contained a phosphatic calculus, whose nucleus was a silk suture, which had evidently ulcerated through the adherent uterine and vesical walls, and thus escaped into the bladder.

Ovarian Dermoids.

Byford (*Chicago Med. Rec.*, April 1898) records a case of an ovarian dermoid which weighed 70 lb., which he removed successfully from a woman æt. 52. She had known of the existence of a tumour for twenty-five years, but as she believed in "faith healing" had refused operation till she was almost *in extremis*. She was very ill for twenty-four hours after operation, but afterwards recovered completely.

Bäcker (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 3) reports two rare forms of dermoid tumour. In the first, the patient, æt. 47, had borne a child two years before, and suffered from incontinence of urine for twenty years; her physician had diagnosed a calculus ten years before. On examination, a calculus, the size of a goose egg, was felt in the posterior wall of the bladder. On operation it was found that the stone had for its nucleus a tumour the size of a pigeon's egg, on whose surface two teeth and a strand of hair were found, while in its interior were centres of ossification. At the time, this was thought to be a primary dermoid of the bladder, but at the post-mortem it was found that the right ovary was attached to that part of the bladder from which the tumour took origin. In the second case, Bäcker removed a large cyst from a primipara, æt. 27, who had had a normal confinement ten months previously. The cyst, which was ovarian, contained a quantity of dark brown fluid, and a smaller cyst which contained an embryo-like formation, with strands of hair and cartilaginous structures.

VAGINAL HYSTERECTOMY.

MAINZER (*Arch. f. Gynæk.*, Berlin, Bd. liv. Heft 3) reports two hundred operations from Landau's clinic, in which the uterus and appendages were removed per vaginam, for chronic inflammation of the appendages, with a mortality of 4 per cent. In no case were the bladder or ureters injured. He considers that one great advantage of the vaginal method is, that there is no danger of acute intestinal obstruction, which is somewhat frequent when the abdominal method is used, and which did not occur in any of the above cases. He holds that the removal of uterus as well as appendages lessens the disagreeable symptoms which follow extirpation of the ovaries and tubes only. In 25 per cent. of the cases the nervous symptoms which followed were much improved by ovarian extract. The libido-sexualis and voluptas is rarely altered, and there were no psychical disturbances. Mainzer thinks that, should the uterus only be diseased, the appendages should not be removed.

LABOUR COMPLICATED BY VENTRO-FIXATION OF THE UTERUS.

DR. BOYD (*Am. Gynæc. and Obst. Journ.*, N. Y., April 1898) gives the history of two cases of the above. In the first, ventro-fixation had been performed two years previously, and in the interval she had had two miscarriages, and was now the subject of a full-time pregnancy. When seen by Dr. Boyd she had been eighteen hours in labour, and her own medical attendant had applied forceps twice unsuccessfully. On examination, the posterior lip of the cervix was drawn up, and the posterior and the anterior lip and uterine wall formed an obstruction to the engagement of the head. The patient was anæsthetised, the cervix dilated, and the forceps applied. The child was born dead, and as a result of the long labour the patient developed septicæmia. The anterior lip of the cervix and a portion of the floor of the bladder sloughed away. The resulting fistula was repaired, and the patient eventually recovered

In the second case, ventro-fixation with the removal of one ovary was performed three years previously. In May 1897 she missed a period, but continued to have a show every fortnight for three months. In December she had another show, which lasted three weeks; she had great pain in the lumbar, sacral, and inguinal regions. On examination the cervix was drawn upwards and backwards, and the anterior uterine wall was much thickened and offered obstruction to the presenting part.

The fœtus, which presented by the breech, was turned by external version and kept *in situ* with some difficulty for about a fortnight, when labour was induced. Some difficulty was experienced in dilating the cervix, after which a dead child was extracted with forceps.

Dr. Boyd thinks that such cases should be allowed to go to full term if possible, but that careful watch should be kept during the whole pregnancy, as a threatened miscarriage might indicate abdominal section to liberate the uterus. Later, premature labour might be indicated where the presenting part was displaced, and there was much thickening of the anterior wall of the uterus. He thinks that an attempt should be made to rectify any faulty position of the fœtus, and at full term, should the cervix be slow to dilate, manual dilatation or free cervical incision should be practised, and the labour terminated with forceps. In some cases Cæsarean section may be required.

Foreign Bodies accidentally left in the Abdominal Cavity during Operation.

Dr. Herman J. Boldt (*Am. Gynæc. and Obst. Journ.*, N. Y., April 1898) has collected fifty-four cases in which foreign bodies, such as sponges, gauze pads, and clamps have been left in the abdominal cavity during operation, and of these only fifteen had been published. In only two cases was the mistake discovered immediately after operation, and the patient returned to the operating table and the foreign body removed. In many of the cases symptoms developed many months after operation; in one, the patient a year afterwards developed symptoms of intestinal obstruction, and was prepared for operation, when a gauze pad was passed in an evacuation. A considerable number of the cases ended fatally. In the majority of cases the foreign body finds its way into the intestine; if into the large intestine, it is usually voided comparatively easily; if into the small intestine, there may be obstruction. If it does not perforate the intestine, the foreign body usually finds its way to the surface and produces local symptoms, which lead the surgeon to interfere, or it may result in abscess or fistula. Dr. Boldt deplores the frequency of this accident, and the reluctance on the part of operators to publish their cases, as he thinks that by so doing others would be led to take greater precautions against the same accident happening.

The precautions he takes are as follows:—Small pads are discarded almost entirely, and if required are never left in the cavity, but immediately removed when they have served their purpose; if a small area in the pelvis is to be tamponed, a long strip of gauze is used, and to its free end a clamp is attached, or else the end is left outside the wound in the abdomen. For protecting the peritoneal cavity *in toto*, sterilised towels are used; for smaller surfaces, large gauze compresses, to which a long piece of silk or tape is attached, and to the free end of this a pair of forceps is applied. No pad used during the operation is permitted to be cut or torn to meet an emergency. No discarded pads are to be thrown on the floor but placed in a special receptacle. All pads and forceps are controlled by double count, before the beginning and at the conclusion of an operation. Dr. Boldt either personally supervises the controlling count or has a reliable assistant to do so.

THERAPEUTICS.

[illegible] CHARGE OF

[illegible] M.D., [illegible]

[illegible]

CHLORAL [illegible]

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[illegible] RHEUMATISM.

[illegible] raws attention [illegible] atism. Ruel, [illegible] ified in favour [illegible] that while [illegible] sodium is not

3 oz.; ol. ricini, 6 oz.—*M.* Lint is soaked in this, and, covered with gutta-percha and wadding, is kept applied over the joints. The swellings and nodosities often disappear entirely under its continued application. The advantages of this method are—(1) The dose is smaller, and acts just as efficaciously. Absorption is, however, uncertain, but probably not more so than when salicylates are given by the mouth. (2) The stomach is spared as a rule, although not always.

Arendt has also used ichthyol (ammonium ichthyolate) largely as an external application to rheumatic and gouty joints, either alone or in conjunction with salicylates given internally. It has, in acute cases, a marked analgesic effect, and not only the pain but the swelling disappears from the first application onwards. In chronic cases its effects are much less marked. He uses the following—℞. Ichthyol, aq. destill., aa. 3 drms.; lanolin, 1 oz.—*M.* Or what is on the whole better, and not so fluid—℞. Ichthyol, ½ oz.; extr. belladon., 22 grs.; lanolin, 1 oz.—*M.* Ft. ungt. Or, ℞. Ichthyol, spt. rect., aa. 3 drms.; aquæ, 12 drms.—*M.* Ft. linimentum. This last forms a sort of varnish, which can be washed off with water if necessary. It is applied twice daily, and it is always necessary to carefully wrap up the joint. Ichthyol is not so active as salicylic acid, but it forms a good adjuvant to salicylates given internally, and a good substitute where they are not well borne.

Aseptic Ergot Preparations.

E. M. **Houghton** states that hitherto pharmacologists have been unable to agree upon what should be considered the active constituents of ergot, and therefore in his endeavours to procure a reliable preparation he worked in the direction of physiological activity rather than of chemical purity (*Therap. Gaz.*, Detroit, July 1898). The test he used was the effect of different samples and preparations on the comb and wattles of the barn-door cock. It is now well known that in these animals the administration of active ergot induces changes in the blood vessels of the comb, of all degrees, from slight contraction to complete occlusion with consequent gangrene, and hence the reliability of ergot preparations may be readily tested on them. During the past three years he has examined several hundred samples of the crude drug and of its preparations, obtained at random from druggists' shops, with the result that many were found to be almost inert, and that there were very great variations in activity. The great and widespread importance of this is evident from the statement that several inert samples, examined within a short time, represented no less a quantity than 20,000 lb. of crude ergot. Houghton states that his observations have led him to the conclusion that not more than from 50 to 75 per cent. of ergot preparations as offered for sale have any medicinal activity. He is of opinion that the effects usually desired from ergot depend on the combined action of the sphacelinic acid and cornutin contained in it, and these substances are very difficult to separate out from each other. With the purpose of obtaining a preparation of ergot, which should contain a large percentage of sphacelinic acid and of cornutin, and as small quantities of sclerotic acid and inert substances as possible, the following method was used. The crude drug employed was carefully standardised by feeding to cocks, and noting the reaction manifested by the comb. The selected drug was ground and divided into a large number of small parcels, which were then percolated with various solvents. The several extracts obtained, and the exhausted drug left in the percolations, were each tested by feeding to fowls, and the results compared. The menstruum found to produce an extract having the most marked action was selected. This menstruum (which is left undescribed), however, extracts a certain amount of sclerotic acid, which was removed from the preparation designed for subcutaneous administration, as it is somewhat irritating. For the same reason the free acids and acid salts were also neutralised. The fluid was finally concentrated until one part represented two parts of the crude drug. The finished product was found to be almost entirely non-irritating, but would not keep. Instead of using alcohol or antiseptics to preserve it, it seemed more desirable to place the fluid in vessels holding sufficient for one injection, the filled and sealed containers to be then sterilised. The results were entirely satisfactory. The completed aseptic ergot consists of a non-alcoholic fluid preparation, from which the inert substances and ergotinic acid have been removed. After a year the preparation remained quite clear, and was as active as ever. Clinically, its use is prompt and efficient. Houghton expresses the opinion that ergot should always be tested physiologically before preparations are made from it.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Two Cases of Gangrenous Pancreatitis with Disseminated Fat Necrosis.

This lesion is so rare that special notice ought to be paid to all cases. Brennecke (*Journ. Am. Med. Assoc.*, Chicago, 4th June 1898) gives particulars of two interesting cases, which would have been more valuable still had he given a more minute description of the microscopic changes found in the pancreas. The first was a woman, æt. 47, who had been for years addicted to alcoholic excess. While going to market, five days before her admission to the hospital, she was seized with severe cramps in the abdomen, and fell to the ground. She had to be carried home, and the pain was only relieved by morphia. She also vomited several times. The bowels were constipated for the first few days. The sharp piercing abdominal pains recurred several times. They were located in the epigastric region, and did not radiate. On admission the abdomen was distended, tympanitic, and tender. There was an area of increased resistance in the right hypochondriac region. The tenderness, though general, was most marked in the epigastric region. The urine showed a slight amount of albumin, and a few hyalin casts; but at no time was any sugar found. Laparotomy was performed three days after admission, the incision being about 3 in. long, and made in the right hypochondriac region. The intestinal coils were found matted together by a fibrinous exudate. The omentum was thickened, hyperæmic, and studded with small greyish areas, varying in size from a pin-head to a pea. These were subsequently found to be foci of typical fat necrosis. The peritoneal cavity contained considerable clear straw-coloured fluid. The peritoneal cavity was walled off with iodoform gauze, and drainage established. The wound was dressed daily. The pain was much less for a time after the operation. The discharge was at first clear, but soon contained shreds of fibrin and small masses of dirty grey necrotic tissue. The pulse remained at 120 to 130; the temperature varied between 100° and 102°, and the respirations between 32 and 36. On the ninth day after admission, she had an attack of sharp-cutting pains from the lower end of the sternum, running through to the back, which lasted about half an hour. Three weeks after the operation, the condition was much the same as regards the wound and the discharge. The temperature varied between normal and 103°, while the pulse was weaker and more rapid. On exploring the wound, a large cavity was found below the right lobe of the liver, which extended as far as the finger could reach towards the region of the head of the pancreas. Masses of loose necrotic tissue, which varied in size from a hazel- to a hickory-nut, could be taken from it with the forceps. The patient had lost about 10 to 15 lb. in weight. Death occurred twenty-five days after the operation, with symptoms of a slow form of sepsis. *Autopsy.*—The omentum, and to a lesser extent the parietal peritoneum, was studded with foci of a fat necrosis. Most of these were surrounded by a narrow hyperæmic zone. They were circular, white, well defined, and not raised above the level of the surrounding tissue. The intestinal coils were adherent to each other and to the omentum, but easily separated. A considerable quantity of bloody fluid was present in the peritoneal cavity. The pancreas was represented by a mass of grey, granular, necrotic tissue, which was easily torn in removal. The consistence was more liquid in the head and right half. The left half was studded with numerous larger and smaller greyish areas, which fused together in places, forming larger greyish or yellowish masses. These areas were distinctly cheesy and soft, and in places appeared to be formed of retained and inspissated pancreatic secretion. There was a good deal of chocolate-coloured fluid, containing masses of necrotic tissue, lying around the pancreas. The stomach was adherent to the spleen, and behind it was a cavity containing a hæmorrhagic semifluid material, with masses of necrotic tissue in it. Microscopic examination of the areas of necrosis in the omentum and pancreas showed the usual changes found in such cases, namely, a central part of granular non-staining tissue débris, surrounded by a more or less marked zone of densely accumulated leucocytes. There were no signs of tissue proliferation. The second case was that of a man, æt. 43, who had also been much addicted to alcoholic excess. He was taken ill one month before admission to the hospital. He began to have severe pains in the abdomen, which required morphia. He vomited constantly. The pains were located chiefly in the epigastrium, but sometimes in the right and left iliac regions. On admission the abdomen was much distended, there was dulness in the flanks and in the right iliac region. He did not complain of pain, but his abdomen was diffusely tender, most marked in the iliac fossa. His pulse varied between 116 and 120, and was very weak. The temperature was usually normal, rising at times to 101°. Respirations, 28 to 36. On several occasions he had attacks of severe prostration. Sleep was bad. The vomiting was persistent. An exploratory incision was made six days after admission, the incision being about 3½ in. long, and made in the right iliac region over an area of dulness. As soon as the peritoneal cavity was opened, a grey turbid fluid, containing shreds of necrotic tissue and fibrin, escaped. The omentum was much reddened, and studded with white areas. The intestines and omentum were matted together by fibrinous adhesions. The patient died soon after. *Autopsy.*—Well-marked peritonitis. In the omental fat, and to a lesser extent in the abdominal wall, were greyish white patches. The abdominal cavity contained a turbid, greyish red fluid. A large cavity was found in the region of the pancreas. It contained fluid of a dirty yellowish grey colour, mixed with shreds of disintegrated material. The fluid had escaped into the abdominal cavity through a rupture, whose margins were necrotic and of a bluish grey colour. Stretching across the cavity were remnants of the pancreas, much softened. The entire pancreas was involved in the cavity and contents. The fat tissue around the pancreas contained numerous white areas, like those found in the omentum. Microscopic examination of the areas of fat necrosis showed practically the same conditions as in the first case. A bacillus, corresponding to the cultural and other characteristics of the *Bacillus coli communis*, was found in the blood from the heart, and in the spleen, liver, kidney, and in the necrotic areas in the subperitoneal fat.

The Great Omentum.

Adami (*Phila. Med. Journ.*, 1898, vol. i. p. 375, and *Canad. Pract.*, Toronto, March 1898) has carefully examined this structure in 150 consecutive autopsies. The considerable variations in size which it may show are often more apparent than real, unusually small sizes being often due to a ravelling of it, and unusually large sizes to a much distended stomach. Its vascularity is greater than the membrane itself requires, and thus it readily plays an important part in inflammations of the abdominal organs. It quickly and frequently forms adhesions, and readily shifts its position, so that it can readily apply itself to an inflamed area, and, becoming adherent to it, thus limit and shut off inflammation or suppuration from the rest of the peritoneal cavity. It readily pours out lymph and leucocytes upon its surface which must favour adhesions. This power is largely lost in very acute disturbances, such as typhoid fever, and in some exhausting diseases, when serous rather than fibrinous exudation obtains. He gives particulars of the position of the local adhesions met with out of his 150 cases. It is interesting to note here that in a recent paper, Roger (*Compt. rend. Soc. de biol.*, Paris, Feb. 19, 1898) considers that the great omentum has a distinctly protective rôle.

He removed it from rabbits, and one month later inoculated them with staphylococci, and they all died, whereas similar inoculations without previous removal of the omentum did not prove fatal.

THE BLOOD CHANGES IN TYPHOID FEVER.

Kölner (*Deutsches Arch. f. klin. Med.*, Leipzig, Bd. lx. S. 221) thinks the leucocyte count is of value in distinguishing typhoid fever from general miliary tuberculosis, because the former shows a subnormal number of leucocytes, sometimes 1000 per c.mm., and never a leucocytosis. This, however, hardly accords with the experience of all observers. He found that generally the number of leucocytes is less in the second and third than in the fourth weeks of the disease. It continues to increase during convalescence. In many cases with suppurating complications, and in intestinal hæmorrhages, there was no leucocytosis. He considers the subnormal number of leucocytes of more importance as a diagnostic factor than roseolæ, enlarged spleen, typhoid stools, or the temperature. He found both the red blood corpuscles and hæmoglobin diminished during the disease, but rapidly improving during convalescence.

NECROSIS OF THE LIVER IN TYPHOID FEVER.

Engelhardt (*Gaz. hebd. de méd.*, Paris, June 23, 1898) relates the case of a man, æt. 27, who died of typhoid fever. During life the Widal reaction was given, and the post-mortem showed typical lesions of the Peyer's patches. The liver showed a number of greyish patches varying in size, which microscopic examination disclosed to be foci of necrosis filled with the typhoid bacillus.

THE PRIMARY ESSENTIAL LESION OF TYPHOID FEVER.

Mallory (*Boston Med. and S. Journ.*, April 1898) has examined histologically the intestinal lesions in nineteen cases. He holds that the primary essential change is not an inflammatory but a proliferative lesion, similar to that of tubercle, but more diffuse. It is due to absorption of the typhoid poison by the lymphatics, chiefly and partly by the capillaries of the intestine. The toxin diffuses beyond its absorbents, as shown by the extension of the lesion through the coats. The lymph absorption explains the lesions of the mesenteric glands, but those of the rest of the body are due to the toxin circulating in the blood, and are not peculiar to typhoid fever, except in rotation, sequence, and degree.

THE INFECTIOUSNESS OF DRY TUBERCULAR SPUTUM.

Cornil (*Berl. klin. Wchnschr.*, 1898, S. 317) caused guinea-pigs to inhale dried tubercular sputum, mixed with dust swept from an old carpet. In six of them it was sprayed through the open mouth, in another six through the nose. These and thirty-six other guinea-pigs were placed in open cages at different heights in a room, the floor of which was covered by an old carpet, over which dried tubercular sputum mixed with dust had been spread. The carpet was swept on four occasions, so that clouds of dust arose into the room. The guinea-pigs were killed after a time, and forty-seven out of the forty-eight were in an advanced state of tuberculosis of the lungs and bronchial glands. He says that Flügge and others had failed to get similar results, through their keeping the animals in closed boxes, in which the moisture from the expired air, perspiration, etc., soon caused the fine dry hygroscopic particles of dust to swell up until they became too large to penetrate into the depths of the lung tissue.

The Occurrence and Significance of Eosinophile Cells in Tubercular Sputum.

Teichmuller (*Centralbl. f. innere Med.*, Leipzig, 2nd April 1898) examined the sputum of 153 phthisical patients, and found eosinophile cells in 111 of them. They are present in the initial stage of the disease, becoming less numerous when the bacilli appear, and may disappear altogether when they become numerous. Whenever the patient improves, especially if the bacilli diminish in number, the eosinophile cells again reappear. Residence in the country often brought them back. In the forty-two cases in which the cells were absent, some unfavourable condition was present, *e.g.* high temperature, advanced and rapidly progressing disease, heredity, etc. He thinks the eosinophile cells indicate a good resisting power on the patient's part, and make the prognosis more favourable, besides enabling us to measure the amount of benefit he may be deriving from the treatment employed.

PHYSIOLOGY.

UNDER THE CHARGE OF

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The Constitution of the Simplest Proteids.

It has been the aim of some of the ablest chemists of the present and of the past to arrive at some knowledge of the constitution of the proteids, and yet how comparatively little has been acquired! We know that certain proteids have more or less definite solubilities, undergo certain changes during digestion, rotate the plane of polarised light to the left, contain or do not contain sulphur, iron, phosphorus, or iodine, furnish on decomposition bodies of the fatty or aromatic series, and are more or less definitely localised in certain tissues or fluids, and we know little more.

It is true that the decomposition products of the proteids have been investigated by a large number of scientists, and theories propounded as to the constitution of the more highly constituted proteids; but there has never been until the most recent times a clear statement, based upon facts, as to the probable constitution of the simplest forms of proteids.

Perhaps in no domain of physiological chemistry has there been a greater tendency to the elaboration of hypotheses, based upon the most slender evidence, than in that of the products of digestion of the proteids. If we read through the article on this subject in Schäfer's new text-book, where a very complete account is given of the views held by the Kühne school, we shall be astonished to find how very ill-defined some of the products of digestion are.

Seeing that this is the case—and that it is so, any inquirer can make out for himself by going back to the original papers of Kühne, Neumeister, etc.—we are all the more indebted to the steady, and what the Germans aptly term *bahnbrechend*, investigations of Kossel. One of the ablest contributions to the study of the proteids he has just published in the *Ztschr. f. physiol. Chem.*, Strassburg, Bd. xxv. Heft 3–4, S. 165.

The simplest group of proteids which we at present know is the so-called protamin group, which includes certain fairly strong bases that are found united to nucleic acid in the spermatozoa of the salmon, herring, and pike. This group is, in all probability, represented in the molecule of all proteids, and is the body to which the biuret reaction of the proteids is due. There are certain important properties which are common to the protamin group, and are of importance as showing their relationship to the more complex proteids.

1. On hydration, as, *e.g.*, after boiling with dilute sulphuric acid, bodies are formed, in the first place, which may be regarded as the peptones of the protamin group, namely, what Kossel terms *protones*.

2. On further hydration, they split up into certain basic decomposition products, namely, lysin, histidin, and arginin, characterised by the fact that they possess six carbon atoms. These have been called by Kossel the hexone bases.

The similarity of the protones with the peptones is striking.

1. They are produced not only by hydration, with dilute mineral acids, but also from the action of trypsin.

2. They give a pink biuret reaction, not a bluish violet, as the protamins do.

3. Their sulphates are much more soluble than those of the protamins.

The members of the protamin group are precipitated by acetic acid and potassium ferrocyanide, picric acid, phosphotungstic acid, etc. There are, however, certain characters common to some classes of the proteids which members of the protamin group do not possess, *e.g.*, the formation of bodies of the aromatic series on decomposition—tyrosin (Millon's reaction), amido-phenyl-propionic acid, indol, and skatol. They are also not attacked by pepsin, nor do they furnish mono-amido-acids, as, *e.g.*, leucin on decomposition. They do not contain sulphur. If one, then, regard the protamin group as the simplest class of proteids, it must be looked upon as the true radicle of the proteid molecule. One may then class the proteids as follows:—

1. The protamin group, without any addition.

2. A group which has added on to the protamin nucleus mono-amido acids, *e.g.*, leucin, aspartic acid, glycocoll. Into members of this group may also pass sulphur and iodine. Gelatin and spongin may be taken as examples of this class.

3. This and the following group (4) include, in addition to the above, a member of the aromatic series, *e.g.*, tyrosin. Group 3 does not contain sulphur, and examples of it are fibroin (of silk), and probably peptone.

4. Group 4 contains sulphur, and is otherwise the same as Group 3. It includes the larger number of the proteids.

Members of those four groups may unite with one another, and so increase the complexity of the proteid.

Kossel makes an interesting comparison between the polysaccharides, with their relationship to the monosaccharides, and the protamins, with the bases, containing six carbon atoms (hexones). Thus, by gradual hydration of the polysaccharides, the dextrins, and then finally the monosaccharides or hexoses, are obtained.

After the same process with the protamins, first of all, protones, and then hexones, are obtained. This final splitting of hexones may take place by a loosening of the oxygen atoms binding the hexones together, as in the case of the monosaccharides, or perhaps the connection between the hexone molecules is by imid-groups. By decomposition of the protamin present in the salmon and herring spermatozoa, one molecule of histidin, three of arginin, and one of lysin are obtained. The protamins present in the majority of proteids seem to furnish more lysin on decomposition than that above mentioned.

In a succeeding paper in the same journal, Kossel, along with Mathews, discusses the action of trypsin on protamin. The results which they obtained I have mentioned before, namely, first of all, protones, and then hexones, are formed.

The next question was as to the nature of the body which Kühne termed antipeptone. Kossel's assistant, Kutscher, took this subject up. Following Kühne's directions with the greatest fidelity, he found that by tryptic digestion of fibrin, lysin, histidin, and arginin are formed; and these bases must, from their solubilities, be present in antipeptone. That is to say, Kühne's antipeptone is a mixture of heterogeneous bodies, among which the hexone bases are present in considerable quantity.

When we remember how many years have elapsed since Miescher first of all described the protamin of the salmon spermatozoa, and how long this knowledge has lain, one might say, buried in text-books, our indebtedness to Kossel for his researches becomes all the more marked. The earnest desire of all interested in this subject will be that Kossel may succeed at last in doing for the proteids what Emil Fischer has done for the sugars.

Albumoses in Urine.

The majority of cases previously described as peptonuria have now been shown by Stadelmann to have really been albumosuria. Three forms of albumosuria have been described, classified according to their origin, namely, pyogenic, enterogenic, and endogenic.

In the pyogenic form, the albumose is believed to be derived from the breaking down of pus cells; in the enterogenic, its source is considered to be the digestion albumoses, which, owing to intestinal ulceration, with loss of epithelium, have not been transformed into serum albumin.

The endogenic group includes a large number of conditions, of which it would be impossible to give a full description here; the albumose in this case, owing to an abnormal proteid metabolism, being perhaps derived from a process of intracellular digestion, *e.g.*, in leucocythæmia, osteomalacia, etc.

Since the majority of cases are pyogenic, a search has been made for the appearance of bodies in the urine, derivable from breaking down pus cells. In a few cases the nucleo-histon found in the latter has been observed in the urine, and the same is true of histon.

Great care, however, has to be exercised in accepting their conclusions, as there is always the risk that these albumose-like bodies have been artificially prepared during the laboratory method of separation from the nucleo-albumin of the urine. Many of the cases in which nucleo-histon has been found in the urine, as, *e.g.*, in cystitis, are those in which one would expect the nucleo-albumin of the urine to be increased, owing to the catarrhal inflammation causing an increased breaking down of the epithelial cells lining the urinary tract. This objection has, I think, special force in regard to a paper published by Jolles in the *Ztschr. f. physiol. Chem.*, Strassburg, Bd. xxv. S. 236, where this danger has not been sufficiently guarded against.

DISEASES OF THE EYE.

UNDER THE CHARGE OF
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ACUTE EPIDEMIC OPHTHALMIA.

HARDLY a year passes by, says Greeff, without an alarm being given that in such and such a place, acute Egyptian ophthalmia has broken out. No district can be said to be quite free, and each year acute ophthalmia makes its presence felt in or about Berlin, causing widespread distress and fear. One recalls how in the early Napoleonic time, Egyptian ophthalmia is said to have destroyed the sight of many hundreds in a few days; and should such an epidemic break out, our fears would have only too good a foundation. In pursuance of orders from Government, Greeff has had good opportunity to study carefully true trachoma in regions where it is very common, and also one such epidemic in a district hitherto free of that disease. He proceeds to discuss the features of certain epidemic ophthalmias which, though often both by profession and laity confounded with trachoma or Egyptian ophthalmia, is really distinct from it, and ought to be differentiated from that disease. The mode of outbreak is not like that of trachoma, which does not spread with the rapidity manifested by this disease; trachoma is no doubt contagious, but every contagious ophthalmia is not trachoma, and it is very important in regard to treatment and results that no error should be made. The contagious character of trachoma shows itself rather in the slow invasion of the other members of a family or household, of whom one or more has been affected for years, and this usually in a country or district where the disease has been endemic for a century, or it may be for ten centuries; when the "ophthalmia" breaks out suddenly and extensively it is not trachoma. He next proceeds to contrast certain forms of conjunctivitis with one another and with trachoma.

1. *Pneumococcus conjunctivitis.* — The pneumococcus (Fränkel-Weichselbaum) occurs as an occasional inhabitant of the normal conjunctiva, and it may increase so as to bring about an epidemic. It is generally children who are attacked; adults are but rarely affected, and seem to resist the disease better. It is a transient malady, running a benign course somewhat quickly; there is a slight œdema of the lids, and there is a free lachrymal or muco-lachrymal secretion. Giffard has succeeded in cultivating the pneumococcus from the discharge from inflamed conjunctivæ during an epidemic, and producing the disease by planting in other sacs.

2. *Morax and Axenfeld's diplo-bacillary conjunctivitis.*—This is a more chronic variety, in which the lids participate largely. In cover-glass preparations the germs are very numerous, lying for the most part in pairs, less frequently in chains. Implantation upon normal conjunctiva produces typical conjunctivitis. It is not certain that any epidemic of this has actually occurred.

3. *The conjunctivitis of the Koch-Weeks bacillus.*—This seems to be the most frequent of the contagious conjunctivites. When in Egypt, Koch found the germ in cases of the slighter form of so-called Egyptian ophthalmia. Weeks found it to be the cause of acute contagious (epidemic) conjunctivitis, and his observations have been abundantly confirmed since then by numerous investigations. This form of conjunctivitis sets in very rapidly; within two or three days the conjunctiva is strongly reddened, the lids swollen, and an abundant serous exudation begins, which after a few days becomes purulent. Both eyes are usually affected; pain, lachrymation, photophobia, and a sense of burning are complained of. The inflammation lasts about two weeks, and the prognosis is uniformly good.

These are the ordinary forms of contagious conjunctivitis. The gonorrhœal form (with Neisser's bacillus) and streptococcus conjunctivitis require mere mention. Some hold, too, that phlyctenular conjunctivitis is of bacterial origin. As regards the bacterial origin of trachoma there is nothing settled; whether a diplobacillus or *Bacillus septatus* is the cause is not certain. In case of an epidemic conjunctivitis arising, it is possible to make a diagnosis of its true nature by examination for micro-organisms. Sometimes it happens that the medical officer of a school makes the alarming discovery that a great number of the scholars are suffering from follicular enlargement, and he may find it necessary to close the institution. He must be careful not to be misled by an epidemic follicular catarrh, or, to be more accurate, follicular swelling. Schmidt-Rimpler, while engaged in the study of the cause of the frequency of short-sightedness in schools, noticed that many children suffered from some affection of the conjunctiva, and decided to make inquiries as to the frequency of catarrh, etc., at a time when there was no epidemic: he found a percentage of 34. On investigation, Greeff finds follicles in 27 per cent. of the children. Even if this be an exaggerated estimate, it indicates that upon the mere discovery of follicles along with epidemic conjunctivitis, one must not say, "Here is Egyptian ophthalmia." But to what are these follicles due? The author, with others, believes them to be due not to contagion but to a general pathological condition; they are quite common in anæmic girls whose conjunctivæ are not in the least inflamed. Prolonged fomentation of the eye (as in the treatment of iritis, etc.) will produce them also. The difference between them and trachoma granules is an essential difference.—*Berl. klin. Wchnschr.*, May 1898.

Coloured Rings round a Flame.

The occurrence of coloured rings of light has long been familiar to the profession as a symptom of glaucoma, under the name of the glaucoma halo or rainbow, and it is known also to be present in certain persons quite apart from disease—as a physiological peculiarity. Druault is one of these, and he records the results of his investigation of his own unusual condition, which he has studied with much care.

This ring or halo is best (or only) seen when the pupil is dilated; it presents more or less distinctly all the colours of the spectrum, green as a rule predominating, and has a striated aspect, the striæ being radially placed. It may be seen either by dilating the pupil artificially, or by looking at a distant small point of light in a dark room; placing the light in front of a dark background, and some distance before it, brings out the phenomenon best. The colours are arranged as in the rainbow, blue and green nearer the flame, red to the outside; when the light is very feeble one only sees green, the other colours not appearing; yellow is only visible if the colours are particularly vivid. It is a notable feature, too, that the intensity of the colours is not uniform all round the circle, but varies at different points; where the brightness is greater, radial striation may be distinctly seen. The actual size of the halo depends, of course, upon the distance to which it is projected, but the extremities of one of the diameters are always seen under the same angle by the same person; and it is curious to observe, too, that the dimensions vary but little between one person and another.

A very singular feature of these rings is seen on passing a screen or card in front of the eye: say that a card is passed horizontally (with a vertical edge) between the observing eye and the light. As it advances, two segments of the circle, a right and a left, begin to disappear, the upper and lower remain till the last, diminishing in size more and more as the pupil is gradually covered: this fact has been known for many years. It might be supposed that since mydriasis is necessary for the manifestation of these rings, they would be invisible through a pinhole or other very small aperture; but it is found that though that is the case when the aperture is opposite the centre, it is not so if it be held at one edge of the enlarged pupil. In such a case a circle of diffusion is seen with the light to one side of the area, and two small portions of the halo are visible outside of but close to the border of the circle of diffusion, at two extremities of a line passing through the luminous point. If one moves the card so that the aperture describes a circle all round the periphery of the pupil, each portion of a halo will also be found to describe such a circle. It is sometimes possible, when working with the pinhole aperture, and a very small and bright luminous point, to perceive portions of a double circle. Druault has no doubt that it is a diffraction phenomenon, due to the crystalline lens, which is only produced peripherally; the central portions are not apt to cause it. He has experimented with the lenses extracted from the eyes of the horse, rabbit, ox, sheep, and pig; and in some of these animals was able to show the condition by passing light through the lens in the laboratory, but not in all.—*Arch. d'opht.*, Paris, May 1898.

HETEROCHROMIA AND CATARACT.

THE "colour" of an eye depends upon the amount of pigment in the stroma of the iris, for the posterior pigment layer is fairly uniform in all complexions; possibly the degree of thickness of the iris itself has an influence on the tint. As is well known, the irides of a new-born child are (always?) of a deep blue colour, and the tint which the structure is to assume is determined by the deposition of pigment during the first eighteen months or so of life. It may happen that delay or non-development of this pigment may occur in one eye, resulting in heterochromia, a condition which must be regarded as a sign of imperfect development of that eye. In the opinion of some authors, cataract is more frequent in the "blue eye" than in the darker one, though the subject is passed over in most of the text-books. Bistis of Constantinople records two more cases in point; in the first of which, though their colours were different, one eye of a boy of 15 was as good as the other; in the second, there was cataract in the "blue eye" of a woman of 38, though none in the other (brown) one. In the opinion of some, prognosis as to operation is not so good in persons with heterochromia as under normal conditions.—*Centralbl. f. prakt. Augenh.*, Berlin, May 1898.

[In this country, where the population is so mixed with Saxons, Normans, Celts, Scandinavians, etc., such cases are far from being so very rare, and, so far as I have seen, the blue eye is certainly the more likely to become diseased. Whether the conditions as seen among us can be regarded as in any sense pathological is quite a question.—W. G. S.]

THE CONDITION OF THE VISUAL PURPLE IN DETACHMENT OF THE RETINA.

FOR the purpose of his investigations into the matter, Andogsky employed rabbits in which he had induced detachment of the retina by introduction of copper or by injection of salt solution into the vitreous humour. When the latter substance is employed, the rods and cones remain in their normal state for a couple of days, then undergo varicose degeneration, and shortly after the sixth day all traces of them have disappeared. His experiments were conducted in a dark room by sodium light, in order to prevent untimely decomposition of the visual purple; the enucleated eyes were hardened in formol, which seems to increase its resistance to changes in the light. The coloration by visual purple or its decomposition products is also visible in detached retina, but disappears with the disappearance of the rods and cones. Inflammatory processes and degeneration of the rods do not greatly affect the colouring matter, and retinæ in which the rods are quite degenerated may be as well coloured as others in which they are retained. Even till the degeneration of the rods is complete, the disappearance of the colouring matter only takes place in the light, and does not occur when the eye is kept in the dark. The tint of the detached retina depends solely upon the amount of visual purple it contains, and degeneration of the substance never takes place after decolorisation has once occurred. Decolorisation is more rapid, the more intense the light, and therefore may be considerably delayed if the media are more or less opaque. These investigations tend to confirm the theories of Kühne regarding the rôle of the retinal epithelium in the regeneration of the visual purple. Circumstances may render the degeneration of the detached retina slower in the human subject, and it is not quite certain whether, in the rare cases of cure, the visual purple had again developed; such could only have taken place if the layer of rods and cones and the epithelium were to a large extent intact.—*Arch. f. Ophth.*, Bd. xliv. S. 2.

ANALYTICAL REPORTS.

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Iodoformogen

(Agent—B. Kuhn, London).

Numerous attempts have been made to produce an odourless but still efficacious modification of iodoform; almost invariably, however, their antiphlogistic powers have been in direct proportion to the penetrating power of their odour. Iodoform, as is widely but not universally known, possesses little or no antiseptic property; it has to be disinfected by boiling or other means before it can be used with absolute safety. It, however, has been proved to possess strong antiphlogistic properties, especially in tubercular affections. Iodoformogen appears to be the first successful modification supplied, in which the actions of iodoform are retained while most of its penetrating odour has been abolished. The preparation is in the form of a fine amorphous powder of a lighter yellow colour than iodoform, freely soluble in water and not injured by sterilisation at 100° C. It has a slight odour, resembling both iodoform and iodine, when closely smelt; its presence about a room or on the person is indistinguishable. The *causa causans* of this absence of smell lies in the fact of an intimate combination with albumin. How this circumstance acts we do not know, but evidence exists to show that the compound acts as beneficially, more cautiously, and therefore with more lasting effect, than its prototype, fails to impregnate the room or its unhappy employer with an attractive though repulsive smell, and appears to cause symptoms of local or general toxæmia in a far fewer number of patients. It will certainly form a most valuable boon in surgical work, should its initial promise be corroborated by further and extensive trial.

Liquor Sedans

(Parke, Davis & Co.).

The ordinary fluid preparations of *Hydrastis Canadensis* and of *Viburnum prunifolium* are sufficiently abominable to render any attempt to supply active preparations containing them in a palatable yet unaffected form deserving of approbation. Their undoubted efficacy in the treatment of menstrual disorders increases the obligation. The addition of a Liquor Sedans to the list of palatable compounds, containing the active principles of both these plants, and devoid of any marked nauseous taste, is a step in the right direction. Liquor Sedans contains in every ounce 60 grs. of *Hydrastis*, 60 grs. of *Viburnum prunifolium* (the "black haw"), 30 grs. of *Piscidia erythrina* (the Jamaica dogwood), along with various aromatics, and has no pronounced taste of a disagreeable character. *Piscidia* possesses sedative properties upon the genito-urinary tract; and the combination in a pleasant form of these three drugs should prove of the greatest use to the practitioner in all appropriate cases of menstrual and uterine disturbance. Actual experience has lately corroborated our theoretical judgment.

FERRU-COCOA

(Ferru-Cocoa Manufacturing Co., London).

WE confess to the possession of a grave doubt as to whether an article of food, combined with a medicinal substance, can ever be so useful in the treatment of disease or the upkeep of health, as the article of food given by itself, along with the administration of the drug in question in a separate form. However, it is very probable that attractive combinations serve both their constituents. We are sorry to find that the Ferru-Cocoa contains that delusive material extracted from the kola nut, so suggestive of actual tonic value, so useless in the preservation of future power. Cocoa, malt, and some iron salt in a palatable and digestible form would be a very creditable combination, sufficiently tonic and stimulating in the absence of the kola-nut principles to merit favourable commendation.

As the preparation is constituted at present, a pleasant beverage is yielded, when the necessary procedure has been carried through; a beverage possessing the sustaining powers of cocoa and malt, the digestive influence of the latter, the tonic effect of iron salts, and the temporary enhancement of both mental and physical powers due to the derivations of the kola-nut. Chemically, the preparation is as pure as can be wished for; theoretically, bar the kola, it forms a useful nutrient and palatable beverage, the taste of the iron salts so often disliked by patients being entirely covered by the cocoa.

A VEGETABLE FAT.

A SAMPLE tin of albene has been sent us for trial by the manufacturers, Broomfield & Co., Upper Thames Street, London. Albene is a fat of purely vegetable origin, resembling lard in appearance, but it has almost no smell or taste. One great advantage which it appears to possess is its freedom from any tendency to become rancid. We have subjected it to the best possible test by sending part of it down to our cook, for practical purposes. The result was most satisfactory. It answered all the ordinary purposes of lard, and the food prepared with it was exceedingly palatable. Theoretically, such a fat should be of considerable service in the dieting of dyspeptics, and might also be beneficial in those strumous children to whom fats of animal origin are abhorrent. An absolute proof that this product is free from animal substances, is given by the fact that the supervisor of the Jewish ecclesiastical authorities certifies that albene may be used by his co-religionists; indeed, should it be desired, tins so warranted can be obtained from the makers.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Four Weeks ending July 30, and for the Year from January 2.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 2.	Actual.	Accumulated from Jan. 2.	
		Above 42°.	Below 42°.					
Mean	57°·2	*[1] 398° [2] 1229°	0° 649°	2·8	16·4	141	861	2°·4
Observed	56°·3	[1] 401° [2] 1315°	0° 427°	1·2	13·4	189	878	2°·5
Difference	– 0°·9	[1] +3° [2] +86°	+ 0° – 222°	– 1·6	– 3·0	+48	+17	+0°·1

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland, during July, and since January 1. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Nervous System.		Respiratory System.	
	No.	Ratc.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 961 [2] 7825	170·5 197·9	223 1549	39·6 39·1	96 746	17·2 18·8	113 888	20·0 22·4	129 1593	22·6 40·3
Actual Deaths and Rate per 10,000	[1] 1024 [2] 7737	181·2 195·7	207 1667	36·7 42·1	104 762	18·4 19·2	130 907	23·0 22·9	149 1384	26·3 35·1
Difference from Mean	[1] + 63 [2] – 88	+10·7 - 2·2	–16 +118	– 2·9 +3·0	+8 +16	+1·2 +0·4	+17 +19	+3·0 +0·5	+20 -209	+3·7 – 5·2

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 72 [2] 478	12·8 11·9	31 201	5·5 5·0	56 587	10·0 14·8	110 787	19·5 19·9	47 330	8·1 8·3
Actual Deaths and Rate per 10,000	[1] 77 [2] 558	13·6 14·1	26 182	4·6 4·5	72 627	12·8 15·8	91 787	16·1 19·9	47 381	8·1 9·6
Difference from Mean	[1] +5 [2] +87	+0·8 +2·2	– 5 – 19	-0 9 -0·5	+16 +40	+2·8 +1·0	– 19 ±0	– 3·4 ±0	± 0 +51	+0 +1·3

* Note.—The figure [1] denotes the data for July, [2] for year to date.

The mean temperature for July was nearly a degree below the normal, although the day degrees over 42° were slightly over it. The most remarkable features were the great decrease in the rain-fall, the defect being as much as 57 per cent. of the total expected; and the increased sunshine, the number of hours of bright sunshine above the normal figure equalling 37 per cent. of it. The daily variability of temperature was practically normal.

From the beginning of the year, the accumulated temperature values remain as for the previous month; the decrease in the rain-fall for the seven months has reached 3 in. below the average precipitation, or in other words 18 per cent. is awanting. The great prevalence of bright sunshine in July has converted the former deficit into a surplus for the year to date.

Notwithstanding the dry, sunny weather, the death-rate was 10·7 per 10,000 over the normal, but no system can be identified as concerned especially in the increase. The most marked increase occurs in the respiratory disorders, chiefly pneumonia. Influenza caused six deaths. The death-rate for the year to date, per 10,000 per annum, is scarcely altered from that of June, save by a lowering of the excess under constitutional, of the defect under respiratory disorders.

Thus July, characterised by bright, dry, sunny weather, due to anti-cyclonic distribution of pressure, an almost normal variability of temperature, a mean temperature which was a little below the average, shows an increased death-rate, especially from respiratory disorders, although the type of weather prevalent was that ordinarily supposed to be that least likely to affect the respiratory tract.

EDINBURGH
MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

THE MALARIA PROBLEM IN THE LIGHT OF EPIDEMIOLOGY.[1]

By ANDREW DAVIDSON, M.D., F.R.C.P.Ed., *Lecturer on Tropical Diseases, School of Medicine, Edinburgh.*

IN what form does the plasmodium of malaria exist outside the human body, and in what way is the infection communicated to man? Is it present as a soil protozoon in malarious localities, or is it a parasite of some species of suctorial insects or of some vegetable organism peculiar to malarious districts? and by what agency or vehicle, and through what port, does it effect its entrance into the economy? This, to my mind, is the malaria problem, on the solution of which depend our hopes of effectually combating this most destructive of tropical diseases.

The search for the plasmodium outside man has hitherto proved fruitless. We do not know where to look for it, whether in the soil, or in the water, or in the air, or in some animal or vegetable organism. Even if we had it under the microscope, we should not be able to identify it, for we do not know in what form it may be present in the surroundings of man. We have hitherto been groping blindly after it, now in this direction, now in that, without any clue to guide us in our search.

A vague idea associating insects with malaria may be traced in the works of the great Roman writers, Varro, Vitruvius, and Columella (a century before to a century after our era). Our own Sydenham remarked, "that if swarms of insects, especially house-flies, were abundant in summer, the succeeding autumn was unhealthy."[2] It was left to our President, Dr. Manson, tentatively to advance the hypothesis that the plasmodium is a norma parasite of the mosquito or of some other suctorial insect, "passing from mosquito to larva, and from larva to mosquito in never-ending series." The pools in which the malaria-infected insects die, become contaminated, and the parasite may be swallowed in water by man. The mosquito-haunted pools dry up; the dried sediment containing plasmodia is blown about by winds and currents of air, and may thus be inhaled by man. Besides, "many mosquitoes die without getting to water; all male mosquitoes die without seeking water. The bodies of such mosquitoes fall in time on the soil and decompose. The parasites they contained pass into the resting stage, and in this form they may be carried into the air by currents, or be blown about as dust, or be shaken out by man when he disturbs the soil. In this way, too, the plasmodium may find a route to man. In this way, too, we may explain the occurrence of those cases of malaria which apparently, though not really, are unconnected with swamp or stagnant water."[1] According to this view, man is an occasional host of the plasmodium, and it is removed from the circulation of this host by the mosquito, within which it develops. The human infection, however, is only an episode, so to speak, in the life-history of the parasite. Its main cycle is completed in its insect host. Ross's researches further point to the conclusion that each form of parasite has its own appropriate species of mosquito in which alone it can develop. A dapple-winged insect he believes to be the host of the crescent-forming parasite; a barred-backed one, that of the tertian parasite.

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[1] Read before the British Medical Association, 27th July 1898.

[2] Sydenham's Works, *Syd. Soc. Translation*, vol. i. p. 271.

This hypothesis is clearly a good working one; for it is one which can be verified by actual observation and experiment. It gives us a clue to follow, namely, the fate of the parasite in the mosquito fed on malarial blood; and the researches of Ross, to which we have referred, justify the hope that in following this clue we shall be brought sensibly nearer to the solution of the problem, as I have stated it.

This hypothesis has given birth to others. Bignami suggests that the malaria germ, present in malarious localities as a soil parasite, is inoculated into man by the mosquito and allied species of insects which deposit their ova in water or in humid places.[2] Koch, who fully recognises the weight of the evidence implicating the mosquito in the malarial process, and mentions the interesting fact that in a small island on the German East African Coast, where there are no mosquitoes, there is also no malaria, believes that man is infected by inoculation. As the Texas fever in cattle is transferred from one herd to another solely by the agency of the tick, so, he supposes, is malaria propagated. The mosquito, he says, "receives the parasites, transmits them to its eggs and the young larvæ, and only the next generation is able again to infect with malaria parasites."

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[1] Manson, Goulstonian Lectures, *Brit. Med. Journ.*, London, 21st March 1896.

[2] *Ann. di méd. nav.*, Rome, Feb. 1897, in a notice of article, entitled "A proposito delle ipotesi recentemente emesse dal Manson," in *Policlin.*, Lúglio 1896.

We have thus three mosquito theories which are at present engaging attention, each giving rise to researches that cannot fail to advance our knowledge of the subject. It is not my design to discuss the comparative merits of these hypotheses. My own attitude towards them is one of hopeful expectation. We may be quite sure that if one or other has in it a basis of truth, it will have to undergo important modifications in directions perhaps little anticipated, as research proceeds. I do not appear, therefore, as an *advocatus diaboli* to find fault. My object rather is to inquire how far the mosquito hypothesis in any of its forms, or in some possible modification, can be made to harmonise with certain well-established epidemiological facts, which will find their explanation when the true solution of the problem has been attained.

The facts to which I shall briefly refer are the following:—(1) Epidemics of malaria resulting from soil disturbance; (2) the invasion of countries and districts previously free from the infection; (3) the extinction of malaria in countries where it formerly prevailed; (4) slow-spreading epidemics of malaria, in which, as the disease advances, it dies out in the region just visited; (5) local epidemics caused by the formation of artificial marshy foci; (6) ship malaria; (7) the prevalence of malaria in northern latitudes at the season of the year when the temperature is under the freezing point, and when insect life is in abeyance.

1. No fact in the history of malaria is better established than the frequent appearance of epidemics in connection with soil disturbance.[1] These may occur—(*a*) In distinctly malarious countries in which the disease is endemic; (*b*) in regions where malaria had been previously little known; and (*c*) in localities where it had for generations been practically extinct.

The instances of a marked increase in the prevalence and intensity of fever following disturbances of the soil in malarious regions, such as Panama and other parts of Central America,

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[1] This proposition has lately been contested by Surgeon-Major Moore (*Indian Med. Rec.*, Dec. 1897), who has had the courtesy to forward me his paper. I quote his conclusions *verbatim* without attempting to answer them—a task that would require too much space:—

"It appears, then, that there are three distinct categories in which all the cases where soil disturbance has been accused of causing malarial fever may be placed—(1) Where the disturbance of the soil has interfered with the subsoil drainage, and caused a marsh or an allied condition; (2) where outbreaks of fever have been coincident with works executed in the soil, but not due to the simple disturbance of the soil; (3) where malarial fever has been caused by a specific poison, released and brought to evidence by the breaking up of the soil.

"Of the cases that fall within the first category there are plenty, but, as I have shown, it is a misnomer to speak of them as caused by soil disturbance. Of the second class there are also plenty; they belong to the type of the gentleman previously mentioned, who contracted the fever by digging in his garden. These cases are valueless. That malarial fever is caused in the manner specified in the third category there is no sufficient evidence to show."

Brazil, and Mauritius, will readily occur to the minds of all familiar with the subject. They could well enough be accounted for by assuming either that the mosquito-bred parasites present in the soil in a resting form have been "shaken out," as Manson puts it, and inhaled in the air, or swallowed in water; or, on Bignami's theory that a soil parasite, set free by upturning the earth, has furnished an unusually large supply of virus to the inoculating insects to work with; but how are they to be explained on Koch's hypothesis?

No less numerous are the instances of very severe malarial outbreaks following soil disturbance, in regions where malaria had not been previously much in evidence. I shall quote a case in point, which I recently met with in Mackay's work on Formosa. "I spent," he says, "weeks with the savages in the mountains near Mount Silvia, and found them generally healthy. Pepo-hoan farmers moved into the neighbourhood, and began to build huts, and to cultivate the land. Within one week the entire settlement was prostrated with fever in its most intense form, and the sufferings of the poor savages were sad to see." A well-known instance of the same kind is that recorded by Wenzel, of the severe epidemy that broke out during the construction of the harbour in the Bay of Jadhe on the North Sea. I mention it because there comes out in connection with it, as in many other epidemies of the same kind, a point which cannot at present be readily explained on Manson's hypothesis. It is this: "There is not only a corresponding increase in the average severity of the form of sickness as the summer advances, but also a preponderance of the shorter rhythms, and an approximation to the continued type; while with decreasing intensity in the colder months there is a corresponding lengthening of the rhythm to tertian and quartan." Upon the assumption that the infection is caused by the setting free of long imprisoned insect-bred germs from the soil, it is difficult to explain why the parasites of the short-rhythm fevers should monopolise the hot season, and those of the tertian and quartan the cold season respectively. They are "shaken out" of the soil, hypothetically, at the same time, yet the different parasites do not give rise to fever as they are brought to the surface, but each type appears in its regular season, just as in endemic and epidemic fever not arising from soil disturbances.

Still more interesting, perhaps, are those outbreaks which have been observed to follow disturbance of the soil in connection with the making of railways, the digging of canals, the laying of gas pipes, and so forth, in regions in which malaria has been as good as extinct for many generations. Trousseau mentions several recurring outbreaks of this kind in Paris during this century. "Even here in Paris," he says, "where intermittent fevers are of such rare occurrence that we hardly know them, they have shown themselves on similar occasions (that is, on the upturning of the soil). In 1811, during the digging of the Saint Martin Canal, a veritable epidemy of intermittent fever prevailed in the districts of the Temple, the Villette, and Pantin. In 1840, there was a similar outbreak when the fortifications which now surround the capital were being raised. The diggings of latter years required in opening up the town by new streets and boulevards, the construction of sewers and underground passages for gas pipes, have caused numerous paludal affections; and more than one physician has been surprised by meeting with cases of pernicious fever which he was little accustomed to encounter in his practice."[1]

In the same way, ague was observed to increase to a marked extent in London, and hypertrophy of the spleen to become common in children, at the time when the Metropolitan Railway was being constructed.[2] In this kind of outbreak, too, just as in the others, all the types—quotidian, tertian, quartan—are represented; and the various grades—mild, severe, and pernicious—make their appearance, and follow their usual seasonal evolution. These soil epidemies are difficult to explain on any theory—perhaps not more so on the hypotheses we are considering than on any other. I am not prepared to say that the mosquito or gnat-bred plasmodium may not preserve its vitality for many generations embedded in the soil. Of course it has still to be proved that the plasmodium assumes a resting form. It is singular, however, to find all the forms indiscriminately "shaken out" of the soil develop one after the other in their ordinary seasonal sequence.

2. There are a few instances on record of the sudden appearance of malaria in countries where the disease was previously unknown. It will be enough to mention the disastrous outbreak in Mauritius in 1866–68, and in the island of Réunion, one hundred miles to the south-west of Mauritius, in 1869.

In Mauritius the infection spread slowly, *de proche en proche*, from one point to another, taking three years to complete the circuit of the island, thirty-seven miles long by thirty-five broad. In Réunion, on the other hand, it appeared at a remote and isolated point, having no communication with Mauritius, and spread with great rapidity, surmounting mountain chains nine thousand feet high, advancing against winds, and invading the whole littoral, whatsoever was the nature of the soil. I have been informed that a malaria-nursing mosquito was for the first time introduced into Mauritius in or about the year 1866. If this were satisfactorily established, it would afford very strong evidence indeed in favour of the mosquito theory. Some difficulties, perhaps not insurmountable ones, would, however, still remain. In Mauritius in 1866, and in Réunion in 1869, all the types and forms of fever appeared simultaneously. If the observations

[1] Trousseau, "Lectures on Clin. Med.," *New Syd. Soc. Translation*, vol. v.

[2] *Med. Times and Gaz.*, London, 29th February 1856.

already alluded to, which indicate that each parasitic form requires a special host, are to be accepted, then not one but several plasmodium-nursing mosquitoes must have been introduced at the same time into Mauritius, and later again into Réunion, a rather unlikely coincidence. Upon Koch's theory, if it really assumes that any mosquito may serve as a host for the parasite, I see no reason why malaria should not have been introduced into Mauritius at any time since its first colonisation, for crowds of malarious patients were continually being introduced from Madagascar and elsewhere from the earliest period of its occupation. I shall just add, that I have never seen or read of an epidemy of malaria in which all the types have not been present,—a fact which, to my mind, supports Laveran's view of the unity of the parasite.

The island of Rodriguez, lying three hundred miles to the east of Mauritius, remains to the present day free from malaria. It would be interesting to know if any species of mosquito met with in the malarious districts of Mauritius and Réunion are absent from Rodriguez.

The instances of the sudden appearance of malaria in an isolated region in which it is not endemic, as a part of a general outbreak, are somewhat more numerous than these just referred to. They evidently present, in a somewhat different form, the same problem that meets us in Mauritius and Réunion.

Let me mention one instance in point, taking the well-known Professor Bergman of Upsala as my guide. Malarial fever is not endemic on the east coast of Sweden, at any point north of Angerman River, in latitude 63°. In the spring of 1846 malarial fever became epidemic at the endemic foci of the disease on the east coast, not, however, in the district of Nyköping, an intense endemic centre, and quite close to the localities suffering from the epidemy. It also prevailed on the shores of the Mälar Lake, and at some points on the Venar Lake. But the remarkable fact to which I wish to direct attention is its appearance, also in the spring of 1846, in Lülea—a marshy district at the head of the Gulf of Bothnia, close on the 66th parallel. We can hardly suppose that a plasmodium-nursing gnat or mosquito had been introduced in the spring of that year into a place bordering on the Arctic Circle, for the temperature at that season, in that region, is much below the freezing point and incompatible with the existence of the developed insect. It is remarkable, too, that it should have appeared there coincidently with its outbreak in the south, while the intermediate coast line, and even noted malarious localities in the immediate neighbourhood of the epidemic centres, were spared. I do not know what type or types were met with in this remote, isolated region; but it is evident that if all the types were represented, as was the case elsewhere during this outbreak, the difficulty would be materially increased.

The difficulty as to its appearance in spring may possibly be removed by considerations which will be noticed as we proceed.

3. The decline or complete extinction of malaria in countries where it formerly prevailed is an epidemiological fact of great importance in its bearing on this and kindred theories of the infection.

Malaria is now practically extinct in many parts of England and Scotland, where it prevailed in the last century, and even in the early years of this century, and its disappearance has evidently followed on the drainage and cultivation of the soil. Has the drainage of marshy land led to the disappearance of some species of gnat or other suctorial insect from these localities? There are still, fortunately for science, some malarious districts in England, and it would be of extreme interest to ascertain whether any species of gnat are present in these which are absent from non-malarious localities. Surely our entomologists should be able to answer this question. It is said that there are nine species of gnat in Great Britain. Are any of these peculiar to malarious districts? If so, it would be desirable to repeat Ross's experiments, by feeding them with malarial blood, and observing if any pigmented bodies, such as he describes, are developed in them.

4. There are several instances on record of malarial fever spreading slowly over regions previously healthy, and disappearing in the districts recently invaded as it steadily advances onwards in a given direction. These may be called marching epidemies. They are like the onward march of an army, which, as it pushes forwards, leaves the country previously occupied free from its presence. The disease in these cases does not last longer than two or three years in one locality.

Such was the nature of the epidemy that spread over a great part of New England in the end of the sixties and in the seventies. The fever was not restricted to marshy localities, for high lands, free from pools and standing water, were attacked apparently as often and as severely as humid and marshy places. All the fever types were represented, and the worst congestive forms were prevalent during the height of the epidemy. Here, there could be no question of water supply or of soil disturbance. Perhaps, if we knew more of the habits of the insects supposed to breed or inoculate the parasite, this kind of outbreak, at present so mysterious, might find an explanation.

5. We have also examples of quite local and temporary outbreaks, clearly dependent on the establishment of marshy foci in some locality where malaria is little in evidence or altogether absent. Malarial fever broke out in Bound Brook in New Jersey in 1881, from the temporary formation of an artificial marsh of sixty or seventy acres. The inhabitants, numbering from a thousand to thirteen hundred, who had previously been quite free from fever, were *all*, without exception, attacked with inter-

mittent and remittent fevers and neuralgias. When the obstruction which caused the marsh was removed, and the land converted into meadow, the fever immediately disappeared.

Belonging to the same category are house epidemies. An instance of this kind is recorded by Friedel and quoted by Parkes[1] as occurring in the Marine Hospital at Swinemunde near Stettin. A large day ward for convalescents was evidently malarious, for after a patient had occupied it for several days he was sure to be seized with tertian fever of a severe kind. In no other ward did this occur. On examination, a large rain reservoir filled with rotten leaves was found to have overflowed and to have formed a marsh, 4 to 6 square ft., close to the doors and windows of the room, which, on account of the hot weather, were kept open at night.

If the plasmodium is a normal parasite of insects which live in marshy localities, the creation of a marsh may be supposed to lead to the immigration into such locality of an insect previously absent from it. Up to a certain point, therefore, these local epidemies are explicable on this hypothesis; but the sudden appearance of one or more plasmodium-nursing insects in localities from which they were previously absent, and the rapid infection of an entire community, present difficulties not to be ignored.

I have no satisfactory explanation to offer of house epidemies, such as that related. On Bignami's inoculation theory, it would be difficult to account for the infection being restricted to a single room, for, however limited may be the range of these creatures, they would not likely have failed to effect an entrance into the other wards.

6. Ship malaria. Malarial fever, or at least a fever presenting all the clinical features of that disease, has been observed to break out on board ship, on the ocean, in circumstances which absolutely preclude the possibility of the infection having been contracted on shore. Assuming that these fevers are really caused by the hæmatozoon of malaria, they appear to me to be absolutely irreconcilable with Bignami's inoculation theory, for gnats and mosquitoes are not met with at sea. It may be held that a mosquito-bred plasmodium was present in the ballast or cargo, and in some of the instances the possibility of this must be admitted. A case in which the fever seems to have been caused in this way is related by Simon. In March 1887, while the French ship of war *La Vipère* was stationed in the Bay of Halong, six out of a complement of seventy-seven men were seized with malarial fever. None of them had been on land for a long time; the bay was not marshy, and the temperature at the time ranged from 12° to 15° C. Simon concludes from this that the infection was not contracted on land, but developed on board. In the lowest hold there was a quantity of slimy sand which had been

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[1] Parkes, Edmund, "Manual of Pract. Hygiene," 7th edition, p. 19.

taken in as ballast, and which, being near the engine, was kept at a high temperature. This hold had been occupied as a sleeping-berth by the six malaria-stricken patients. Simon was of opinion that the germ of malaria was in this sand, and had become diffused in the air of the hold. The disease ceased as soon as the hold was cleaned out and disinfected.[1] But how are we to explain the cases in which the infection was apparently caused by the air of a mouldy store-room, as in Holden's well-known case,[2] or those in which it has developed during a voyage from a non-malarious country, from the planking of a vessel having become wet during stormy weather, which prevented ventilation? Perhaps it would be wiser to wait until the malarial character of house and ship outbreaks has been demonstrated by microscopical examination of the blood before speculating.

7. The season of maximum malaria prevalence in temperate climates is not summer and autumn, but spring, when the temperature in northern latitudes is under freezing-point.

The disease often develops in a severe epidemic form in very cold weather. Frank tells us that he witnessed intermittent fever to reign in Vilna in the month of February, when the thermometer marked 13° below the zero of Fahrenheit. Walther says that in Kieff and the eastern governments of Russia epidemies of malarial fever show themselves when the whole country is under a firm covering of ice, and in these circumstances attain a higher intensity than in the hot summer time.[3] These facts have been rather ignored in speculations about malaria, yet they must fit in with any true theory of the disease.

It is generally held that the absence of malaria from high latitudes and altitudes is owing to their low temperature. Hirsch fixes the summer isotherm of 59° or 60° F. as the limit of malaria in Europe, and concludes that regions in which the mean temperature of the warmest months is under 59° F. are exempt from fever, as this summer-autumn temperature is necessary for the evolution of the infection.[4] He does not, however, explain in what way the temperature of summer and winter can affect the evolution of a disease which in these latitudes is not a summer and autumn one, but essentially a spring disease.

If we examine the accompanying diagram, it will be seen that in Sweden the fewest cases of malaria occur in July and August, which are the hottest months, and the next fewest in December and January, which are the coldest months. In Leipzig malaria is essentially vernal. Here there is no autumn rise. In Dittmarschen, in Holstein, where the country is marshy and where malaria is intense, we have two marked outbursts, one in spring, the other in autumn, the maximum prevalence falling on autumn.

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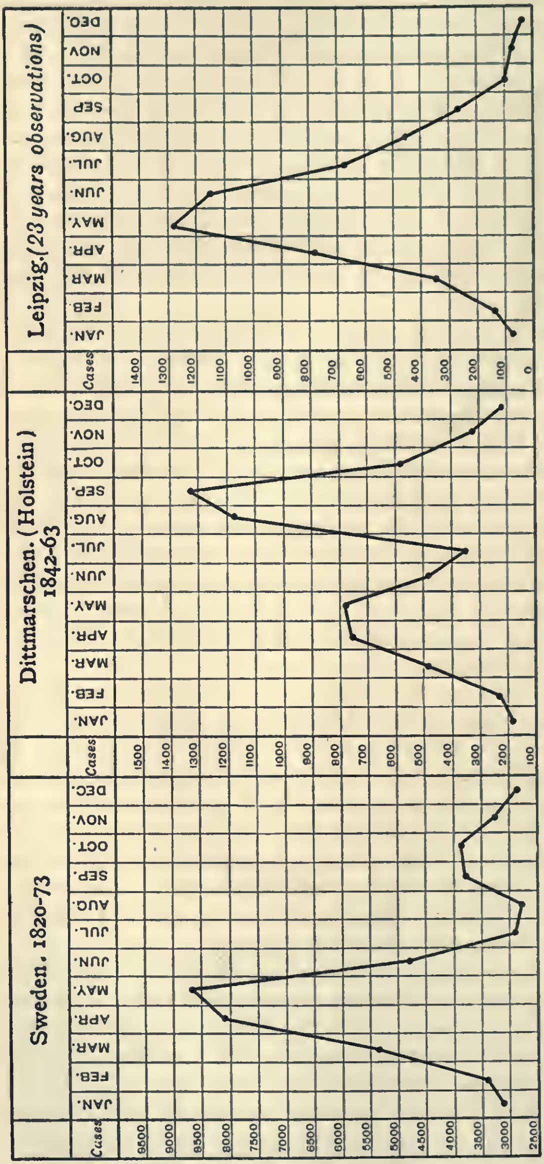
[1] *Rev. d'hyg.*, Paris, 1888, tome x. p. 978; condensed from Scheube, "Krankh. der Warmen Länder."

[2] *Am. Journ. Med. Sc.*, Phila., Jan. 1866.

[3] Walther, *Med. Ztg. Russland*, St. Petersburg, 1867, S. 99, quoted by Hirsch.

[4] Hirsch, "Geographical and Hist. Path.," vol. i. p. 252, *New Syd. Soc. Translation.*



The question whether the spring and autumn fevers, in countries such as Sweden and Holstein, are caused by the same parasites, cannot be looked upon as definitely settled. Mannaberg, however, says that he has never met with crescents in Vienna, where the disease is mainly vernal, but where a very distinct autumn outburst, somewhat more marked than in Sweden, is also observed. This points to the conclusion that the spring and autumn fevers alike belong to the simple or large parasite forms — not to the malignant or small parasite crescent-forming varieties. There is no reason, then, for supposing that there may not be some genetic relation between the autumn and spring broods of fevers. What is that relation?

If the summer and autumn temperature be really the factor which determines the latitudinal limit of malaria, then we are forced to the conclusion that the germ grown—whether in soil or in mosquito—in summer and autumn must give rise to the crop of fevers appearing in the succeeding spring. If the spring infection is not caused by an autumn-grown germ, then, I maintain, the temperature of summer and autumn has nothing to do with the limits of malaria, or with the presence or absence of malaria in these countries. The appearance of malarial fever so early as February in northern latitudes is clearly irreconcilable with the view that the infection is inoculated in spring by gnats or mosquitoes, for I presume that these insects are absent at that season from these ice-bound regions. Nor can we suppose that any plasmodia are bred at that season. Assuming, then, that the spring crop of fevers in these latitudes are the harvest, so to speak, of seed grown in the soil, in the mosquito or some other insect, during the preceding summer and autumn, how are we to account for them breaking out in spring? Two explanations suggest themselves—(*a*) We may suppose that the spring febricants contract the infection through the air, by food or water, or by inoculation during the summer and autumn, and that it remains latent in the system during the winter, to break out in the spring. The germ may in this case be supposed to be introduced into the body in a stage of development at which it cannot produce fever, that it has to undergo development or metamorphosis in the spleen, the medulla of the bones, or other internal organs, for a time corresponding with the period of latency. The infection contracted during the early part of summer would manifest itself as a febrile disease in February, that contracted in autumn later. (*b*) We may, on the other hand, suppose that the germ produced in summer and autumn has to undergo some development outside man, in the soil or in some other animal, before it becomes infectious to man; and that it is only in spring, after it has undergone the necessary changes outside man, that it effects an entrance into the human body and gives rise to fever. Whichsoever of these two views may ultimately prove correct, I have no doubt that the spring fevers are the brood of summer and autumn germs.

Looking now at the whole question as it presents itself to my mind, in the light of Ross's observations, and the analogy of parasitism, I shall state my views in a few sentences.

The malaria parasite is not dependent on man for its existence. It meets him, to his sorrow, in regions previously uninhabited. This fact in its history is adequately accounted for, on the supposition that the plasmodium lives and multiplies in the soil of malarious localities, and finds its way into the system in water or air, or, as Bignami suggests, by inoculation, the virus being conveyed from the soil in which it is present by the agency of mosquitoes or other insects. But on this theory, which implies that man is merely an accidental host of the plasmodium, it is difficult to explain how a soil parasite should adapt itself so perfectly to life in man, should develop and multiply in the system, and become latent there until conditions favour its renewed activity. This perfect adaptation to its human host is not what one would expect in a parasite whose normal life-cycle is in the soil. The forms of the parasite which come into existence after the blood is removed from the body, and which seem to have to do with the extra-corporeal life of the plasmodium, have no meaning on this hypothesis.

The theory that the parasite is removed from man by the mosquito, in which it undergoes development, and in the second generation is able again to infect man by inoculation, affords no explanation of how it exists and maintains itself where man is absent, how disturbance of the soil gives rise to epidemics, or why the disease is absent from countries where mosquitos abound.

We have no difficulty in accounting for the presence of malaria in uninhabited regions, on Manson's hypothesis, that the plasmodium is a normal parasite of the mosquito. This mosquito-bred plasmodium is hypothetically there to infect him as soon as he intrudes into a malarious region. But this theory is not without its difficulties. If we assume that any mosquito or gnat is capable of serving as a host of the parasite, then the introduction of a single malarious patient into a healthy country would give rise to an epidemy of fever, which is not the case. If each form of parasite has its own appropriate host, as Ross on grounds of experiment affirms, this difficulty is got over, for unless the suitable mosquito is at hand, the presence of a malarious patient will not suffice to start an outbreak. But a difficulty of the kind we have mentioned in connection with the soil hypothesis meets us; for if the parasite completes its life-history in the mosquito alone, and can maintain itself in this insect without requiring the aid or intervention of man or of any other animal, how are we to account for its perfect adaptation to life in its human host, or for the fact that in him it runs a different cycle from what it does in the mosquito; in other words, that its cycle in that insect is apparently complementary to that which it runs in man? Man is clearly not an alternative host of the parasite, in the sense that it can run in him the same cycle as it does in the mosquito, and can thus take the place, so to speak, of the mosquito in relation to the parasite. From the glimpses we get of it in the mosquito's stomach, after it has been removed from man (assuming always, as is highly probable, that the growing pigmented bodies described by Ross are malaria plasmodia), we feel assured that the life-cycle of the parasite in its insect host is altogether different from that in man. Man is the alternative host, only in the sense that the parasite runs one part of its cycle in him, the other and complementary part in the mosquito. Why, again, we may ask, should the plasmodium gratuitously attack man, if its existence is assured by the mosquito alone, and why should provision be made for its removal from the blood of man if this removal is not necessary for its propagation? May we not rather conclude that man and the mosquito are both necessary for its propagation, its cycle being from man to mosquito and from mosquito to man in never-failing series? And this is what appears to be the case in respect to the closely-allied proteosoma of the sparrow. It runs a double cycle—from sparrow to mosquito and from mosquito to sparrow. There is no evidence that it can complete its life-history in the mosquito alone. Are we not therefore justified on the ground of analogy, in assuming that the malaria parasite also requires two hosts for its continued existence?

But if we assume that man alone serves as the host in which the first part of its cycle can be run, the presence of the parasite in malarious countries before the advent of man is inexplicable. As the proteosoma can run the first part of its course in the crow and lark, as well as in the sparrow, may we not suspect that man is not the sole alternative host of the parasite *vis-à-vis* to the mosquito, but that other animals present in malarious countries may, in the absence of man, and even when he is present, serve as the host of the parasite, in which it runs the first part of its life-cycle, and from which it is removed by the agency of the mosquito, in order to complete its cycle in that insect. It may be quite true that any mosquito cannot serve as a nurse for every form of the parasite, but the fact that the tertian parasite, as we know it in Europe, exists in India, where it is propagated by a barred-backed mosquito which does not exist in Northern Europe, points to the conclusion that not only may some of the lower animals fulfil the *rôle* of man, but other species of insect may take the place of the dapple-winged and barred-backed mosquitoes as hosts of the parasites.

I do not think of the disease in regions uninhabited by man as passing from mosquito to larva and from larva to mosquito in never-failing series, but as passing from the mosquito directly by inoculation, or indirectly through soil, water, or air, to some animal in which the parasite runs a cycle analogous to that observed in man, and from these, again, to the mosquito or other insect feeding on the blood of these malariated animals, and so on in never-failing series.

It may be urged against this view that it is contrary to the results of inoculation experiments, and unsupported by observations of the occurrence of malarial fever in the lower animals. Too much importance is not to be attached to the negative results which have followed the injection of malarial blood into the lower animals, as a proof that the parasite cannot develop in them. It does not follow that animals are immune to the infection because it cannot be communicated to them by inoculation with human blood. Besides, it is quite possible that the alternative host has not yet been found and experimented upon. It is not even certain that the disease in the lower animal, which hypothetically serves as the host of the parasite, is a febrile one. Malaria is not necessarily febrile in man. Apyrexial forms are known.

There is evidence of a kind not to be ignored, that some of the lower animals do suffer from febrile forms of malaria, in all respects similar to, and probably identical with, the human disease. Parke, in his work entitled "Personal Experiences of Equatorial Africa," assures us that the donkeys belonging to the expedition suffered from intermittent fever. Their hair stood on end, their ears drooped, and, as he says, "they looked miserable all over." Their temperature was high, in one case it reached 106° F. in the rectum. The fits were brought on, too, in the same way as those in man. Swimming across a stream always brought on an attack in them, "just as it did in the case of their Christian and pagan fellow-travellers." Lawes, in New Guinea, observed dogs to have shivering fits, followed by a hot stage. These fits lasted for a few hours and returned at regular intervals. Macculloch, long ago, recorded similar observations of malarial fever occurring in dogs in Britain, and many authors assert that they have witnessed tertian fever in horses, cows, swine, and other animals. In none of these cases, of course, has the blood been examined for the malaria parasite; but these facts nevertheless render it by no means improbable that more than one species of the lower animals suffer from human malaria. We shall thus have to look for some animal present in malarious regions that normally performs the *rôle* in which man participates when he appears on the scene, and for other insects that can take the place of the dapple-winged and barred-backed mosquitoes.

Should this view, that the malaria parasite runs a double cycle, and that other animals may take the place of man as its host, prove correct, as I think it will, some of the difficulties which at present surround the etiology and epidemiology of malaria would be lessened or disappear.

Postscriptum.—The day after this paper was read, Dr. Manson communicated to the British Medical Association some important observations of Surgeon-Major Ross, on the development of the proteosoma of the sparrow in the mosquito, which appear to prove that this parasite runs a part of its cycle in the sparrow, the other, or complementary part, in the mosquito. This supports the view that malaria runs only a part of its cycle in the mosquito, and that it must find an alternative host in some other animal in malarious regions from which man is absent. This should encourage observers in malarious countries to seek for the host in which the parasite normally runs, what we may call, the first part of its cycle. The diffusion of malaria will probably be found to depend largely on the presence of this alternative host.

THE OPERATIVE TREATMENT OF MYOPIA.

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I propose, in the following pages, briefly to consider the present position and future prospects of the operative treatment of high myopia. This proceeding appears to have been practised occasionally in the latter half of the eighteenth century, but it was condemned by Albrecht von Graefe and Donders, and sank into oblivion, till it was resuscitated by Fukula in 1889. Since then, it has rapidly established itself as a recognised mode of treatment in certain cases. Indeed, there seems to be some danger lest the pendulum should swing too far, and the indiscriminate adoption of the operation lead to disasters which may bring it into discredit, and obscure its real value.

The operative treatment of myopia consists in getting rid of the lens by some means. Everyone knows that after the removal of the lens from an emmetropic eye—as in the extraction of cataract—the patient requires for distant vision a convex lens of 10 or 11 D. In other words, the refraction has been diminished to that extent. As all power of accommodation (which depends on an alteration in the shape of the lens) is also of necessity taken away, a stronger lens is required for near vision.

It is obvious that if an eye is myopic, *i.e.* has too high a refraction, the result, after removal of the lens, will be different, assuming that the operation produces the same diminution in the refraction. A myopic eye would require, according to the degree of the myopia, a weaker concave lens than before, no lens at all, or a weak convex lens. We shall see later on that, as a matter of fact, the optical effect of the operation in myopia is always higher than in emmetropia, and increases with the degree of myopia.

The fact has long been known that patients who were originally myopic, and had developed cataract, often had good distant vision without glasses, after operation. It would have been but a short step to removal of the healthy lens for the cure of myopia, had it not been for the dread which surgeons had of extracting lenses which were not completely opaque—a dread which was justified by the large percentage of failures.

It is therefore interesting to find that the first suggestion to treat myopia by this means proceeds from one who is not himself an operator. Thus we find the Abbé Desmonceaux writing in 1776.[1] Speaking of myopes whose far point is 2 or 3 in., he says: "This assistance for this class of myope was neither known nor practicable before the operation of extraction, and cannot but prove of great benefit to the working classes." He further makes the interesting statement that he has frequently seen the operation practised with success. There is nothing to show who the operator was in these cases, and contemporary literature throws no light upon the question. It is probable that the operation, though it did not establish itself as a recognised surgical proceeding, was occasionally practised, but that the results were not sufficiently good to lead the authors to publish them.

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[1] "Traité des maladies des yeux et des oreilles," quoted by Otto, *Arch. f. Ophth.*, Bd. xliii. S. 324.

Adolf Weber, in 1858, at the Ophthalmological Society of Heidelberg, suggested removal of the lens for myopia, and stated that he had frequently performed the operation with success; but in the discussion which followed, von Graefe spoke against it. Donders, writing in 1864, treats the suggestion with ridicule.

"A patient, who was an amateur in dioptrics, endeavoured to induce me to perform this operation (extraction of the lens); but I need not say that such a momentous undertaking, doubly dangerous when a myopic eye and a transparent lens are concerned, even in the most favourable case, unless any real advantage is to be expected, would exhibit culpable rashness. Not only would the staphyloma posticum continue equally threatening, but we should also have sacrificed the accommodation—an advantage which that of somewhat larger images, than would be obtained by neutralising glasses, could by no means counterbalance."[1]

The adverse opinion of two such authorities as von Graefe and Donders could not but have great weight, and we hear nothing more of the operation till Fukula published his paper, in 1889, containing an account of nineteen cases, in which he had got rid of the lens, not by extraction, but by discission. Since then he has published other cases. Otto has published a large number, and the treatment has been adopted with increasing frequency, especially on the Continent, where myopia is very prevalent.

In this country the operation has not made much way, partly, no doubt, because of the scarcity of suitable cases, and partly owing to a feeling of uncertainty as to the results. In the first place, it may be pointed out that the objections urged by Donders are not now of much force. The danger of extraction of the lens has diminished very considerably since the adoption of improved methods of operating, and the use of antiseptics. It is, however, often a difficult operation to extract a transparent lens; and in the only case in which the writer attempted it for myopia, he abandoned it in favour of discission. There may be exceptional cases, in which, owing to the age of the patient or other causes, extraction may be preferred; but the recognised proceeding is repeated discission, assisted, if necessary, by curetting or suction. No operation in which the eye is opened can of course be said to be devoid of risk, and the writer did, in fact, lose one case from suppuration; but the risk is certainly slight.

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[1] *New Syd. Soc. Translation*, p. 417.

The loss of accommodation the myope can bear with equanimity. In the cases for which the operation is alone suitable, the accommodation is not used until the object is brought nearer than three inches! Its loss would therefore certainly not be noticed. It is true that the staphyloma remains, but it can hardly be urged against an operation, that a condition persists which the operation was not intended to remove.

It would be well to consider, in the first place, what cases are suitable for the treatment. The immense majority of myopes suffer little inconvenience if they have suitable glasses. If the myopia is slight, and they are under 40, they have good near and distant vision with the same glasses, and, when they get past middle life, they can read well without glasses—a fact of which they are prone to be inordinately proud.

The myope of moderate degree, 4 D to 10 D, may require different glasses for near and distant objects, but as a rule has good vision.

The conditions are very different when the myopia exceeds 10 D. In the majority of such cases, vision cannot, with glasses, be brought up to the normal standard, nor can the glasses which afford the best distant vision be used without discomfort. The subnormal visual acuity is, in some cases, due to morbid changes in the fundus, which can be recognised with the ophthalmoscope. The choroid is often thin, especially in the region between the disc and macula. There is nearly always a crescent of choroidal atrophy on the temporal side of the optic disc, which sometimes extends a considerable distance in the direction of the macula, and there are probably often morbid changes in the region beyond, which, though not visible, are sufficient to impair the function of the retina. At the macula itself there is often evidence of disturbance of the pigment epithelium of the retina, and sometimes an area of definite choroiditis.

Notwithstanding the existence of these conditions, however, vision for near objects is often good, the patient reading 1 Jaeger, or even smaller type, with ease. The ability to do this, in high myopes, does not imply a very high degree of visual acuity, because the type is held so near that the retinal image is of large size, but it does show that the function of the macula has not been destroyed, and it holds out a prospect that distant vision could also be improved if retinal images of sufficient size could be obtained.

Many cases, in which no pathological changes of any kind can be seen with the ophthalmoscope, fail to get good distant vision with glasses. This is probably due to the fact that the divergence produced by a strong concave lens, when held at a distance of a centimetre or more, prevents some rays from entering the pupil, which would otherwise do so. That this is the case is evident from a glance at Fig. 1. From this it will be seen that the size of a pencil of rays, from any point, entering the pupil, depends on the size of the latter; but if, under the same conditions, a concave lens is interposed, a smaller pencil only can enter.

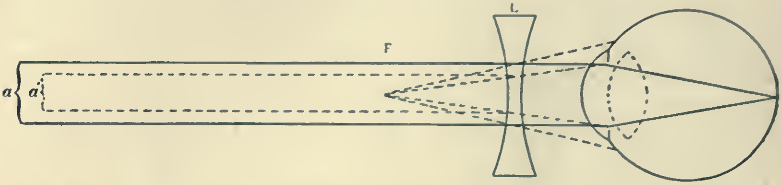

FIG. 1.—Showing effect of concave lens in diminishing the amount of light entering the eye.

Patients often complain that fully correcting glasses make objects look small. The area of the retina occupied by the image is much less than that occupied by the blurred image in uncorrected myopia. The conditions are so dissimilar that it is impossible to compare their effect upon vision, but, as we shall see later on, the retinal images, after removal of the crystalline lens in myopia, are considerably larger than those which were produced by the concave correcting glass.

In dealing with high myopia, we have also to take into consideration the social position of the patient. There are many positions in life from which the wearer of glasses is altogether debarred, or in which his wage-earning capacity is lowered. The majority of domestic servants come under the former category, and labouring men under the latter.

Those who follow out-door occupations, and those who are much exposed to weather, also suffer a good deal of inconvenience from glasses, which are apt to get dimmed by rain.

The conditions of the highly myopic being as described, the question arises, To what extent can they be relieved by getting rid of the lens? To determine this, we must not only consider the optical effect of the operation, but also whether the condition of the fundus is such as to render it probable that good vision will be obtained. We have also to take into account the risk of the operation, and the best mode of proceeding.

The optical effect of getting rid of the lens in high myopia is not so simple as might at first be supposed. We have seen that in emmetropia the operation diminishes the refraction of the eye by 10 or 11 D, but in myopia the effect is greater, and it increases with the degree of the myopia.

This is a fortunate circumstance, for if the effect were the same for all grades, it is obvious that only cases within a very limited range of refractive error could be benefited.

The optical result in any case can always be calculated beforehand, provided that the myopia, as is generally the case, is axial, *i.e.* due to abnormal length of the antero-posterior diameter of the eye. As this is a most important element in deciding whether a case will be benefited, and to what extent, it will be entered into rather fully.

The degree of myopia is always expressed in terms of the correcting lens. In the higher degrees, the position of the latter makes a considerable difference; the further it is removed from the eye the less is its effect. This is because its focus must coincide with the far point of the eye, if it is to correct the myopia; the more, therefore, it approximates the far point the greater must be its strength. It will be convenient to consider the lens that corrects the myopia as placed at the anterior focus of the eye, 15·5 mm. (nearly) from the cornea; and the correcting lens (if any) after operation, also as being at the anterior focal point of the eye. This point will now be further away, namely, at 23·366 mm. But the far point will be so far away that this difference in the position of the anterior focus may be disregarded.

The degree of myopia, as above defined, having been determined, the length of the eye must be calculated. This is done by adding, for each dioptre of myopia, 0·316 mm.[1] to the length of the emmetropic eye, 22·8237 mm.

The length of the eye (L) is of course unaffected by the operation; it remains, therefore, to calculate the correcting lens required by an eye of known length, and having no lens. The length required to make such an eye emmetropic would be 31·095—that being the posterior focal distance of the cornea.

The relation between the length of the aphakic eye and the correcting lens required is found by the following formula:—

$$x = \frac{f_1 f_2}{\pm l}$$

in which

x = the focal length of the lens required, expressed in millimetres $\left(\frac{1000}{x}\right.$ will equal the corresponding number of dioptres);

f_1 = the anterior focal distance of the aphakic eye = 23·266;

f_2 = the posterior " " = 31·095;

l = the difference between the actual length, and the "emmetropic" length, which is f_2, with the + sign if the length exceeds this, and the − sign if it is less.

$f_1 f_2$ is constant, and = 723·456; therefore the formula becomes

$$x = \frac{723{\cdot}5}{\pm l}$$

Example.—Myopia of 18 D—

The length of the eye is 22·8237 + (0·31625 × 18) = 28·5162.

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[1] These figures and formulæ are taken partly from Landolt, "The Refraction of the Eye," and partly from a paper by Percival, *Arch. f. Ophth.*, 1897, Bd. xxiv. S. 1.

If the same calculation be made for different degrees o
it will be found that the effect increases with the d
myopia.

The actual effect on the refraction, of removing th
different degrees of myopia, is shown in the annexed diag

The figures on the left side indicate degrees of myo
30 D. The figures on the top line show the effect of the
on refraction. For example, myopia 20 D.—If the horiz
at 20 be traced to its intersection with the dotted line, i

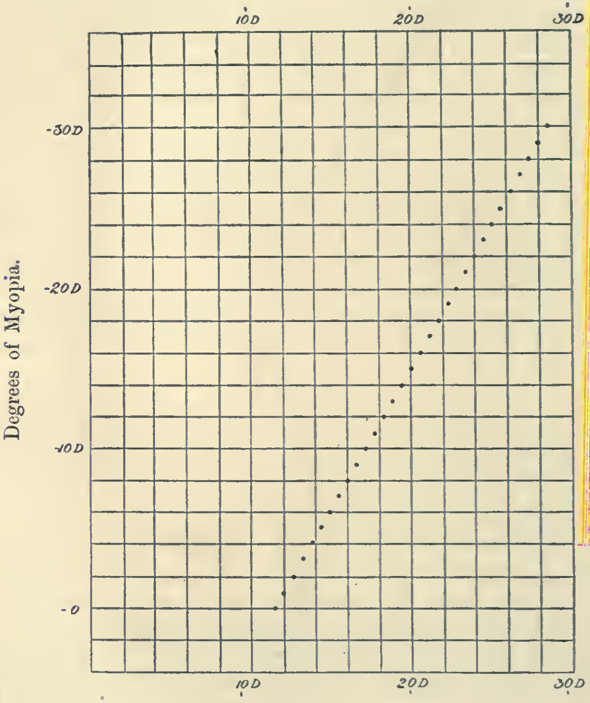

FIG. 2.—Diminution of refraction.

found that this lies under 23, showing that the refraction has been reduced 23 D; therefore the correcting lens, instead of being as before operation, will now be 23 − 20 or + 3 D. In myopia of 30 D, the effect is 18·5, so that the lens required would be + 30 − 18·5, or − 11·5; while in 25 D the myopia is almost exactly neutralised by the operation.

Another important effect of the production of aphakia is the increase in the size of the retinal images, as compared with those obtained when correcting glasses are worn. There can be no question that this factor enters very largely indeed into the patient's appreciation of the result of the operation. The small size of the images produced by the fully correcting lens in myopia is the main cause that patients find them so uncomfortable. This often leads them to prefer a weaker glass, which gives them blurred images which are much larger.

The manner in which the operation affects the size of the retinal images, is shown in Fig. 3.

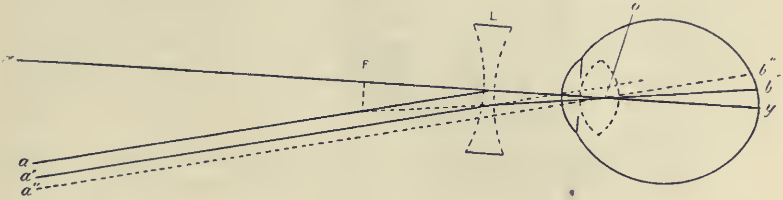

Fig. 3.—Reduction in size of retinal image by concave lens.

Let Fig. 3 represent an eye with such a degree of myopia that it becomes emmetropic on removal of its crystalline lens.

Let L be the lens required to correct the myopia. Its focus (F), therefore, coincides with the far point of the eye.

Let *a*, *a′*, and *a″* be three parallel rays from one extremity of a distant object, of which the other extremity lies on the prolongation of *xy*. Of these rays, let *a* pass through the centre of the lens (L); let *a′* pass through the optical centre of the eye after refraction by *l*, and cut the retina at *b′*; and let *a″* pass through the centre of the eye if the lens (L) were absent, and cut the retina at *b″*.

If we suppose the lens (L) and the crystalline lens to be removed, the size of the retinal image (*b″*, *y*) is determined by the angle at *o*, made by the rays (*xy* and *a″*, *b″*), which is subtended by the object.

When lens (L) and the crystalline lens are present, the image (*b″*, *y*) is determined by the angle formed by the rays from the extremities of the virtual image of the object at F, which is evidently smaller.

To what extent do changes in the macular region prevent a successful result? This is a question always difficult to determine, because the impairment of vision is often entirely disproportionate to the amount of visible change. The ability to read 1 Jaeger with ease is a convenient standard, and is probably sufficient in most cases. It is at any rate certain that the operation should not be performed if vision is below this.

Mode of operating. Risks.—There has always been a prejudice against removal of the lens, when it is not completely opaque, or nearly so. For this reason it was formerly the rule in cases of cataract to delay the operation till the cataract should be "ripe." Nor can there be any question that the cases of cataract operation which cause least anxiety to the surgeon are those in which this condition has been attained. The lens then shells out easily from the capsule, no cortical matter remains in the eye, and the after progress is often free from all complications.

When, on the other hand, the cataract is incomplete, some cortical matter frequently remains after the removal of the nucleus; its removal is troublesome, and may be impossible; and obstinate iritis sometimes follows, leading to the formation of a tough opaque membrane, that has to be dealt with subsequently.

If these objections apply to operating on an immature cataract, they must be of still greater force when a transparent lens is concerned.

In the present day they do not, however, have their former weight; and although, in cases of senile cataract, it is still worth while to wait for practical maturity, as long as the other eye retains serviceable vision, the common experience is that, when for any reason it is found necessary to operate on an immature cataract, the risk of the operation is not much increased.

The difference between the experience of the past and of the present is largely due to the introduction of aseptic and antiseptic methods. There can be little doubt that the iritis, which was formerly comparatively common when cortical matter was left, was largely of septic origin. The softened lens matter probably affords a suitable nidus for the growth of micro-organisms; for septic iritis, after simple iridectomy, has always been one of the rarest occurrences.

It may, however, be doubted whether extraction (which is difficult to perform) is the safest way of getting rid of a transparent lens in the majority of cases, although it may eventually be found to be so in persons over 30. At any rate, this operation has not been extensively tried in cases of high myopia, most surgeons preferring to needle the lens repeatedly, either relying upon this operation alone, or supplementing it by letting out the opaque lens matter by an incision.

The method adopted by the writer in the earlier cases was to perform repeated discission, using the needle very sparingly in the earlier stages, and more freely as the quantity of lens matter became less. This method of treatment has, however, proved to be exceedingly tedious, and just as great freedom in needling has been adopted in cases of lamellar cataract, without obvious increase of risk, and with great shortening of the time of treatment, so it has been found safe to needle cases of high myopia with considerable freedom at the first operation.

The plan now adopted by the writer is to freely break up the lens at the first sitting, and keep the pupil well dilated with atropine. Within forty-eight hours considerable opacity results, some lens matter projecting into the pupil. During the first few days there is sometimes pain and increased tension; this, however, generally subsides, under the free use of atropine; if it does not, an incision is made, when a considerable amount of lens matter usually escapes with the aqueous, and the symptoms subside. If no untoward effects follow the first needling, either it is repeated at the expiration of a week or ten days, or the softened lens matter is then let out. It is seldom that all, or even nearly all, the opaque lens matter can be removed in this manner. A small portion of the pupil may be rendered clear at the time of operation, but it will usually close up by the next day. Several subsequent needlings will generally be required, and at present it does not seem possible to form any idea beforehand how many operations will be necessary. All danger of increased tension seems, however, to pass over after the first paracentesis, and the patient may go out between the operations, and even follow his ordinary occupation.

One great drawback to the proceeding at present undoubtedly is the length of time over which the treatment extends, and the impossibility of giving the patient even an approximate estimate of the time that will be required. It is probable, however, that increased experience will enable us both to shorten the time, and to estimate it beforehand more accurately.

Nothing would be gained by quoting cases in full, but the following is a type of those most suited for the treatment:—

Margaret H., æt. 25, a domestic servant; right eye -25 D $= \frac{6}{60}$. There were some changes at the macula, but 1 Jaeger was read easily. Discission was performed four times, and paracentesis once. Five months after the first operation, vision with this eye without glasses was $\frac{5}{9}$ (three letters).

This case had the amount of myopia best suited for the operation, as the eye is rendered practically emmetropic. She was therefore able to dispense with glasses—itself a great boon in persons in her class of life—and her sight was much better than it had formerly been with glasses.

An effect which the writer has noticed in several cases is, that the patient has bad vision for near objects with the eye which has been operated on. With a suitable lens he will read the smallest type, but in a few seconds the eye tires, vision fails, and he is unable to proceed. The explanation of this condition is still wanting.

Risks of the operation.—If the lens is needled freely the first time, as was the case in all the later operations, the surgeon must be prepared to interfere for the relief of tension. In children, attention is sometimes first directed to this by vomiting; in adults, pain is complained of. In the majority of these cases the rise of tension is temporary, compensating changes soon being established; and if the pupil can be kept dilated, no harm may result. It may, however, be necessary to evacuate the aqueous, a proceeding which gives immediate relief. The increased tension does not appear always to be due to swelling of the lens, for in several of these cases the anterior chamber has not been at all diminished in depth. In such cases there is probably some change in the composition of the aqueous, which interferes with its filtration.

Eyes which suffer from high and increasing myopia are, it is well known, rather prone to detachment of the retina, but there does not appear to be any evidence that this tendency is increased by removal of the lens by discission and paracentesis, although this might be the case if the lens were extracted. In one of the writer's cases detachment did occur, but it followed a blow on the eye, and was probably entirely independent of the operation.

In one case in which $\frac{6}{9}$ without glasses has been obtained, vision became suddenly reduced to counting fingers, owing to the appearance of large opacities in the vitreous. This case is still under observation.

Of course the same risks are involved in these cases as in those in which discission is performed for cataract; among such, intra-ocular suppuration must be reckoned. The writer lost one case from this cause. Three needlings had been followed by no complication, but a fourth, undertaken with the same precautions, was followed by suppuration. Eventually a Mule's operation was performed.

The question of the age most suitable for the operation is not unimportant. The majority of cases will always be those of young adults; for high myopia in children is fortunately rare, and its presence in them so frequently indicates diseased tissues, that it might be well to avoid adopting this method till we have had fuller experience of its action. Older persons—those approaching middle age—have usually settled down to their mode of life, and have become accustomed to the inconvenience of their myopia. It is the young adult who is beginning his work in life, and finds the wearing of glasses an obstacle to obtaining employment, who is most benefited by the operative treatment, and especially persons in the position of domestic servants.

The writer has only operated on one patient over 40—a Government clerk, æt. 48. The myopia was 18 D, and corrected vision $\frac{6}{9}$, but 15 D was the highest glass which could be worn with any comfort; and, as a rule, he preferred 13 D. To avoid risk of increased tension, a preliminary iridectomy was performed. Three discissions and two paracentesis operations were performed. Four months after the first discission, vision, $\frac{6}{60}$, slightly improved by +1·5 D. The result was not brilliant, but the vision was much better than he could obtain with any glasses which he could wear with comfort, and he was therefor able to dispense with glasses, and was well satisfied with the result.

Should one or both eyes be operated on?—The writer is decidedly of opinion that at present the operation should be limited to one eye. The method has not been in use a sufficient time for us to be certain that there is not some risk of late complications, such as secondary glaucoma, or detachment of the retina. Many surgeons believe that a considerable number of cases, which have been operated on for lamellar cataract, with a satisfactory result, subsequently suffer from deterioration of vision. This has not been the writer's experience in lamellar cataract, with regard either to cases operated on by himself or by others, although many have come under his notice years afterwards. Another reason for not attacking the second eye is, that by so doing one of the advantages enjoyed by the patient is neutralised, namely, the ability to see both near and distant objects without glasses. The eye operated on will have good distant vision, while the eye which remains myopic will have good vision for near objects. It is not suggested that it may not be advisable under many conditions to wear glasses, but it is of great advantage to the patient not to be entirely dependent upon them. It need perhaps hardly be pointed out, that the chance of getting binocular vision is too remote to be worth considering. High myopes have generally given up binocular vision so long that they are not inconvenienced by its loss; moreover, the great difference that often exists in the refraction of the two eyes, when the myopia is high, would usually render its attainment impossible.

When the myopia is very different in the two eyes, it will be often found that the patient has been accustomed always to use the same eye for near objects, and obviously this is the eye which should be left as it is.

CONCLUSIONS.—The operation is of great benefit to myopes of not less than 15 D, enabling them to go about without glasses, and, as a rule, giving them better vision than they formerly had with glasses.

The treatment usually extends over a period of three months, but the patient is not confined to his room during the whole period. The risks are not less than in operating on any case of soft cataract. It is possible that the liability of myopic eyes to suffer from opacities in the vitreous, and detachment of the retina, is increased by the operation, but further experience is needed to determine this. In view of these facts, it would seem advisable to confine the operation to one eye, at any rate until we have seen that the results remain good after the lapse of several years.

THE INFLUENCE OF OTHER DISEASES UPON CANCER.

By W. Roger Williams, F.R.C.S., *Preston*.

The hope of discovering a prophylactic, which recent developments in vaccination and "serum therapeutics" have raised, inspires interest in all that relates to the influence of one disease upon another. In what follows, I propose briefly to consider the effects of certain morbid conditions upon cancer.

It has been urged by Lambotte[1] and others, that erysipelatous and suppurative affections are of comparatively rare occurrence in the cancerous; and the inference has been drawn that these maladies—by vaccinal action—protect from cancer.

In order to test the value of this alleged rarity of erysipelas in the cancerous—which is at variance with the impressions I had formed after an extensive experience of cancer—I have examined the statistical publications of some of the large London hospitals, with the following results:—Of 395 extirpations of the breast for cancer, forty were subsequently attacked by erysipelas, or 10 per cent.; whereas, of 173 persons with scalp wounds, under treatment as in-patients during the same period, only eight were attacked by erysipelas, or 4·6 per cent. It would thus appear that the cancerous—instead of being immune from erysipelas—are more than twice as liable to it as the non-cancerous.

Another point maintained by Lambotte is, that there is seldom any evidence of suppurative affections in the pathological antecedents of the cancerous. As I was at some pains several years ago to determine the maladies to which the cancerous are prone, I find that I have at hand the requisite data for testing the validity of this statement. Thus, of 130 uterine cancer patients under my observation, nine had previously suffered from smallpox, five from phthisis, two from erysipelas, two from abscess, two from fistula in ano, and one each from necrosis, lupus, and furunculosis. Of 130 breast cancer patients, five had previously suffered from phthisis, four from smallpox, four from ulceration of the uterus, three from erysipelas, three from old abscesses of the neck, and one each from fistula in ano, suppurative tubercular disease of the knee-joint, otorrhœa, and whitlow. Thus, of these 260 female cancer patients, forty-six, or 18 per cent., had previously suffered from some form of suppurative disease.

For comparison with the foregoing, I have found that of seventy-five women with non-cancerous tumours, twelve had suffered from previous suppurative diseases, or 16 per cent., as follows:—phthisis three, abscess four, erysipelas two, and one each from smallpox, ulceration of uterus, and hip-joint disease.

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[1] "Antécédents purulents des cancéreux," *Presse méd. belge*, Bruxelles, 1896, No. 21, p. 161; No. 35, p. 274, 1896.

It thus appears that Lambotte's second proposition is as unreliable as his first; for, as these data show, the cancerous are just as prone to suppurative diseases as the non-cancerous.

I have seen a great many cancer patients attacked by erysipelatous and suppurative affections; but I have never noticed consequent amelioration of the disease, much less anything approaching a cure. In many cases these superinduced affections lead to a rapidly fatal issue. I believe that most of the alleged cures of malignant disease by erysipelas inoculations, etc., are attributable to diagnostic errors; at any rate, I am convinced that tubercular, syphilitic, and chronic inflammatory affections are often mistaken for malignant disease by experienced surgeons, especially in the breast and uterus; and I suspect that cases of actinomycosis are also more frequently mistaken for malignant disease than is generally believed. Consequently, every new specific for cancer has no difficulty in justifying itself by a crop of "cures," although everyone knows that cancer has never really been cured by any external application or internal medicament whatsoever.

As for those exceptional cases of malignant disease, in which, after an attack of erysipelas or after inoculation with its toxins, etc., arrest or diminution has been observed, evidently such conditions are not due to any specific or vaccinal action of the remedy; for similar effects have been produced by many widely different conditions.

For instance, examples of the regression of mammary cancer, in connection with the acute outbreak of pulmonary tubercle, have been reported by Paget,[1] Sigg,[2] and others. Perrion[3] has seen the same disease subside, after an operation for goitre, followed by much suppuration. Téaillier[4] has often noticed retardation of the progress of uterine cancer during lactation. Jahr[5] has reported an instance of the regression of mammary sarcoma after artificially induced delivery. In cases of intra-abdominal malignant disease, Bidwell[6] and others have observed marked amelioration after simple exploratory laparotomy. Beatson's[7] cases of regression of mammary cancer after oöphorectomy, evidently belong to this category. Similar results have ensued after tuberculin injections, etc. Many other instances such as these might be cited. In the penultimate stages of most exhaustive illnesses, malignant growths often become stationary, and even appear to wither and dry up, shortly before death.

[1] "Lectures on Surgical Pathology," 1853, vol. ii. p. 337.
[2] *Cor.-Bl. f. schweiz. Aerzte*, Basel, 15th April 1891.
[3] *Rev. méd. de la Suisse Rom.*, Genève, tome xi. p. 195.
[4] "Du cancer de la matrice," Paris, 1826, p. 227.
[5] *Centralbl. f. Gynäk.*, Leipzig, 9th June 1894.
[6] *Lancet*, London, 1897, vol. i. p. 1346.
[7] *Brit. Med. Journ.*, London, 1896, vol. i. p. 1386.

The only feature common to all such cases is the extremely debilitated condition to which the patients are reduced; and I think there can be no doubt that enfeebled vitality is the cause of such improvement as is noticeable. The condition of the patient is, in fact, similar to that brought about by what is known as the starvation treatment of cancer, as formerly practised with some success by Hufeland and others.

In the course of my investigations into the life-history of cancer patients, I have been struck with the extreme rarity of *syphilis* in such persons. Of 165 female breast-cancer patients examined by me, not a single one presented undoubted signs of having had syphilis. Of 160 uterine-cancer patients, similarly examined, only one presented signs of having had syphilis.

From the foregoing, and from other indications of like import, it may be inferred that the victims of constitutional syphilis are much less prone to cancer than the non-syphilitic. This comparative immunity of the syphilitic is probably due to the depraved nutrition and lowered vitality, caused by contamination of the system with the syphilitic virus.

The liability of insane persons and idiots to cancer is also decidedly below the average; and they are generally debilitated and of low vitality. The like is true of prison and workhouse inmates.

The alleged immunity of the cancerous from infectious diseases, as signalised by Lubarsch, is not corroborated by such data as I have collected. Thus, of my 267 female cancer patients, thirteen had suffered from smallpox (4·8 per cent.), sixteen from typhoid fever (6 per cent.), and 1·1 per cent. from pneumonia; whereas of eighty-three women with non-cancerous tumours, 1·2 per cent. had suffered from smallpox, 6 per cent. from typhoid, and 2 per cent. from pneumonia. As to rheumatic fever, of my 267 female cancer patients, twenty-four (8·9 per cent.) had suffered from it; whereas of eighty-three women with non-cancerous tumours, seven had been thus affected (8·4 per cent.).

With regard to the inter-relations of cancer and tubercle, it is certainly most exceptional to find both diseases in active progress in the same individual. I have met with this conjunction only twice in 136 cancer necropsies; and Kelynack, at the Manchester Infirmary, has found it only twice in 145 similar necropsies.

Obsolete tubercle is, however, more frequently found in association with cancer than with most other diseases. Thus, of 136 necropsies, or women who had died of cancer, I found well-marked traces of obsolete pulmonary tubercle in seventeen, or in 12·5 per cent. Whereas of 16,562 necropsies, tabulated by Heitler, on persons who had died of various diseases—which included but ·6 per cent. of cancer cases—obsolete tubercle was met with only in 786 cases, or in 4·7 per cent.[1]

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[1] The very conflicting data lately published as to the relative frequency of

The outbreak of cancer often follows or coincides with the healing of pulmonary tubercle, although, in most cases, the intervening period is fairly protracted. Pulmonary tubercle is by far the most prevalent disease among the relatives of cancerous persons, who are very much more prone to it than the rest of the community. Indeed, their liability to pulmonary tubercle is so considerable, as even to equal that of the phthisical themselves. Most cancer patients are, in fact, the surviving members of tubercular families.

Hence I conclude that those who survive the peculiar kind of degeneracy associated with the tubercular predisposition, are at a later period of life specially prone to cancer.

ON THE TREATMENT OF SOME OF THE MORE COMMON EYE AFFECTIONS.

By G. A. Berry, M.B., F.R.C.S.Ed., *University Lecturer on Ophthalmology; Senior Ophthalmic Surgeon, Royal Infirmary, Edinburgh.*

(*Continued from page* 517, Vol. III.)

It often happens that an attack of iritis leaves the eye in a condition which calls for surgical interference. This is only rarely the case in a first attack, if proper treatment has been adopted in time. Should, however, synechiæ have been allowed to form and consolidate, so far as to make it impossible to obtain a dilatation of the pupil, any further exudation, taking place either during the same attack or in the course of a subsequent attack, is liable to introduce more or less serious conditions.

The pupil may then become covered by lymph, or the pupillary margin of the iris become adherent all round. The first condition necessarily causes some, usually very considerable, defect of vision, as the fibrinous deposit is very intransparent. The second leads to interference with the excretion of the liquid, which passes from the ciliary processes to the anterior chamber, and which is absorbed at the angle formed by the peripheral circumferences of the iris and cornea.

This causes a disturbance in the balance which should be main-

tubercular lesions are not a little surprising; they evidently imply great diversity as to the criterion of obsolete tubercle. Thus Brouardel reports having found indications of cured pulmonary tubercle in 60 per cent. of the necropsies on persons over 30, who died a violent death. Harris, at the Manchester Infirmary, found similar lesions in 39 per cent. of all necropsies on persons over 20. Schlenker met with old tubercular lesions in 44 per cent. of the bodies of those who had died of non-tubercular diseases. Coats estimates the percentage at 25, Hughes Bennett at 20, and Fowler at 9. My own experience inclines me to accept Heitler's and Fowler's figures as being correct, when only well-marked lesions are taken into account, and this is the basis on which my data rest.

tained between the secretion and excretion of this nutrient liquid, and results, first in increased intra-ocular tension, with its attendant risks to the retina, and later on in atrophic changes—softening of the eye and irremediable blindness. In both cases the remedy is iridectomy. There is not, however, the same urgency for this operation in the two cases. In the first it is the means of improving vision to a greater or less extent. In the second it is the means of preventing the eye from going altogether to destruction.

A very urgent symptom for the performance of iridectomy is presented by the condition usually spoken of as *iris bombé*. In this condition the surface of the iris, instead of lying in one plane, as it does normally, is bulged forwards into the anterior chamber at its free middle part. This is caused by an accumulation of liquid behind the iris—in the posterior aqueous chamber. If an iridectomy is not done soon after this change in the position of the iris, the vision is lost.

Practically speaking, wherever there is any considerable occlusion of the pupil, or any marked adhesion of the pupil, so that, although the iris, while not totally glued down or bulged forwards, is sufficiently agglutinated to prevent good dilatation in any direction, it is advisable to perform an iridectomy. The iridectomy should then always be large. A small coloboma is very liable to be filled in again by the exudation of a subsequent iritis.

This point is not infrequently forgotten, and yet, in my experience, it is of more importance than a large iridectomy in glaucoma, which is generally recommended. A small iridectomy will check a glaucoma as efficiently as a large one; but a small iridectomy cannot be looked upon as a sufficient safeguard, where the possibilities of subsequent iris inflammations have to be taken into account. It is well also to include some portion of the adhering pupillary margin in the iris excised. To do this sometimes requires a little care. The iris must not be suddenly pulled upon with the forceps, but dragged out by a combined pull and side-to-side motion. If the pupillary margin is left, the effect of the operation is not likely to be so good, from the point of view of improved vision, though it may otherwise be efficient enough.

Another indication for operative interference in iritis, and one which it requires no little judgment and experience to properly recognise, is increased tension during the actual attack of inflammation. I have already referred to this. There is a risk in such cases of doing too much. It is important to hold one's hand as long as possible. If there is increased tension—and this is a complication more frequently met with in serous irido-cyclitis than in plastic iritis—the effect of stopping the instillation of atropine, and also of one or two subcutaneous injections of morphine, should always be tried before resorting to operation.

The only operation suitable in such cases is sclerotomy. Iridectomy should never be done whilst the iris is actively inflamed. I have seen not a few eyes lost from iridectomy done too soon, eyes which there was every reason to expect might have retained some amount of vision.

Sympathetic ophthalmitis.—Though fortunately by no means a common occurrence, sympathetic inflammation is of such serious importance that every medical man should be alive to the conditions which are liable to give rise to it.

The exact nature of this spreading of an irido-cyclitis, of often the most malignant type, from one eye to the other is still unknown. All the clinical facts are, however, so strongly suggestive of the correctness of the view, which ascribes the sympathetic inflammation to changes supervening upon a microbic inoculation of the eye which is first inflamed, that it is practically important to act as if this view were an established fact.

It is true that the experimental as well as the bacteriological evidence have failed to confirm the idea that micro-organisms introduced into the one eye actually find their way by some channel or other into the second eye, and there set up their pathogenic action. It has not, however, been shown that toxines formed by the action of germs in the first eye, do not pass over to the second. The clinical features of sympathetic ophthalmitis are indeed so consistent with this possible origin, that it should, at all events in the meantime, be accepted as a useful working hypothesis. The first eye must be looked upon as the site of production of a poison of microbic origin, even although the actual existence of the specific microbe has so far escaped detection.

Practically the facts to be kept in mind are—that sympathetic inflammation of the second eye only occurs where the first has been perforated by injury or disease, and that some time must elapse between this perforation and the beginning of symptoms of sympathetic inflammation.

The indications for preventive treatment are therefore to remove or otherwise destroy the source from which the poison is distributed, and to do so within a limited time. Cases in which perforation is caused by injury, and particularly those in which the perforating body becomes lodged in the eye, present the greatest risk of exciting sympathetic mischief. It is generally asserted, too, that there are special risks in this respect, connected with wounds of the eye which involve the ciliary body. I do not think that experience altogether warrants this belief. Wounds in this region are on the whole less liable to heal rapidly, and this circumstance, in the case of microbic infection at the time of injury, may possibly create a greater tendency to the conditions favouring the elaboration of the specific poison. Certainly there is no greater risk attaching to clean wounds in the ciliary region than to similar wounds in other parts of the eye.

The special risks are, then, wounds of the eye caused by bodies which are likely to have led to the introduction of micro-organisms. More especially, however, has the state of the eye which follows injuries of such a nature to be taken into consideration. The risk is greatest where it remains irritable and congested over an area which is often limited to that surrounding the site of an enclosed foreign body, or, in the absence of any foreign body, to the neighbourhood of the external wound. When this irritability is associated with marked tenderness on pressure, there is special cause for apprehension.

In the risky cases, the irido-cyclitis which gives rise to these symptoms of irritation is more fibrino-plastic than purulent. Anything like a rapid purulent destruction of an eye following injury, or the perforation of a corneal ulcer, is not likely to be followed by sympathetic changes in the other eye. Either the specific toxines are then not formed, from the absence of the specific germs, or the preponderating and more rapid action of pus-forming organisms, or the channels by which these toxines reach to the other side are sealed and destroyed by the purulent process. Whatever the cause, the clinical fact should be remembered. But it must not be supposed that the mere presence of pus precludes the likelihood of sympathetic inflammation. It is only in the cases in which rapid and extensive purulent destruction results from an injury that this is so. A little hypopyon making its appearance slowly after injury is not only for the most part evidence of the introduction of microbes into the eye, but is a complication which is frequently met with in cases which are afterwards associated with sympathetic irido-cyclitis of the other eye.

We have to consider not only the treatment most suitable for sympathetic ophthalmitis, when it has made its appearance, but also the means of preventing it. It must be confessed that in both cases it is often a matter of very great difficulty to decide upon what is right to do.

Early removal of the injured eye is a perfect prophylaxis. If the injured eye be removed within forty-eight hours, sympathetic inflammation will never occur; and it is, practically speaking, prevented by enucleation, performed any time within the first week after injury. Often the date at which the eye is removed, which may excite inflammation in the other, is, owing to different circumstances, much later. It is then necessary to remember that the second eye cannot be considered safe, if it have hitherto escaped, until a certain time has elapsed. Three weeks after enucleation, the other eye is extremely unlikely to inflame. After six weeks from the removal of the first, it is absolutely safe.

These clinical facts are important, and have to be kept in view. They at all events make the decision of what should be done comparatively easy in the case of blind eyes. When, for instance, a recent injury of such a nature as would be likely to introduce septic matter into the eye has at the same time caused irreparable blindness, there can be no question as to the advisability of enucleation. Suffering will be prevented, and any risk of a much greater misfortune will be obviated by resorting to this measure. It should therefore be urged upon the patient as strongly as possible. A similar proceeding is indicated where a previously injured and sightless eye has become irritable and tender to pressure. Only if the irritation is due to increased tension—a secondary glaucoma—is the necessity for interference of this nature uncalled for.

Injured eyes are, however, far from being always completely blind. In many instances, indeed, a useful degree of vision may still remain, and yet they cannot be looked upon, it may be, as safe in regard to the risk in question. Here it is that the difficulty of determining upon the adoption of the prophylactic effect of enucleation asserts itself. The difficulty is not so great, no doubt, in the case of recent injuries, because at all events the prophylaxis is certain.

In other cases, however, in coming to a decision as to whether a not altogether blind eye, which has been exceedingly irritable for some weeks after injury, or has again become inflamed after a longer period of quiescence, should be sacrificed in the interest of the other, one has to face the possibility of this measure, if adopted, not succeeding in preventing sympathetic inflammation. Under such circumstances, if the second eye should eventually be lost by irido-cyclitis, one might have to blame one's self for having removed the only chance of some remaining sight.

With regard to the inflammation in the sympathising eye, which only comes on within a short time after excision of the exciting eye, the question naturally arises, Is it as severe and intractable as that which is met with where the exciting eye has not been removed? The answer to this is, that whilst on the average it is less severe and more amenable to treatment, experience has shown that it may be quite as disastrous. The same may be said with reference to the effect of enucleation of the exciting eye, when undertaken after sympathetic inflammation has begun. There is then, at all events, a chance that the secondary process may be checked at an earlier stage than would be the case if the source of excitation were allowed to remain.

What applies to enucleation as a prophylactic measure applies equally to evisceration. A properly performed evisceration is capable, under practically the same restrictions, of preventing the occurrence of sympathetic ophthalmitis. It is, however, essential that the evisceration should be complete, and that absolutely no trace of the other parts of the eye should be left within the scleral shell.

Section of the optic nerve without removal of, and with excision of, a piece of the nerve—neurotomy and neurectomy—have also been advocated with the same object in view. I have personally no experience of these operations. The idea of their substitution for the more radical measures of enucleation and evisceration is one which some have considered justifiable, from the belief that the optic nerve is the channel by which a transference of septic matter or specific irritants takes place from the one eye to the other. In this belief the cosmetic advantage of retaining the natural eye, in preference to having recourse to an artificial eye, is the principle underlying the substitution.

It should be remembered, however, that although, as has been said above, the clinical facts of sympathetic disease are so greatly in support of the transference hypothesis, it is hardly justifiable to base any treatment on the supposition that we know the channel by which the transference is effected. Neurectomy has besides not been done on a sufficiently extensive scale to warrant definite conclusions being come to as to its real clinical prophylactic value.

With regard, then, to prophylactic treatment by enucleation, clinical experience has afforded me the following indications by which I am guided in the meantime in my own practice. First, in all cases in which an eye, the coats of which have been perforated by injury or otherwise, is irretrievably blind, and at the same time congested, tender to touch, and of diminished tension, it should be enucleated. This rule should be absolute, and apply also to cases where sympathetic inflammation has already begun in the other eye. It should also apply to the case of a recently injured eye. If an injury has been so severe as not only to have destroyed vision at once, but to preclude any likelihood of a quiet healing, enucleation should be done early. In such cases evisceration may too, where it is preferred, be substituted for the complete removal of the eye. Secondly, in cases in which the one eye is found to be sympathetically inflamed, and the exciting eye has retained some degree of vision, even if the amount retained be barely sufficient to enable the patient to guide himself with difficulty, the exciting eye should not be enucleated, the sight which it has may be, and indeed most frequently turns out to be, all that the patient will eventually have to depend upon. Thirdly, if an injured eye has retained some degree of useful sight, it should only be excised for prophylactic reasons, if this be done some time within the first week of the injury. If, however, the sight remaining immediately after the injury be subsequently lost by inflammation, it should be excised, and the sooner the better.

Such cases of injury by penetrating wounds, with or without the lodging of foreign bodies in the eye, in which all useful sight is not destroyed at the time, are of frequent occurrence. The question comes to be, then, Can one not adopt some measure, other than the removal of the eye, by which the risk of sympathetic inflammation can be lessened or removed? Of late years I have succeeded in a number of cases in checking the inflammation which has followed upon injuries of this kind, and thus attacked the source from which a transference to the sound eye takes place.

This treatment consists in injecting directly into the vitreous chamber a few drops, from 4 to 6 minims, of freshly prepared, fully saturated chlorine waters. This is the most powerful, and at the same time most diffusible, antiseptic. It does not coagulate the vitreous as other antiseptics do, it does not cause pain, and it does not destroy the sight. The introduction must be made through an opening in the sclera which is considerably greater than the tube of the syringe. Unless a means of escape is provided for the displaced liquid, the injection of even a few drops would cause a serious rise in the intra-ocular tension. The chlorine injection may even be repeated, if a recurrence of the inflammation should show itself after a temporary check. The injection is also a good adjunct to any treatment which may be required for removing a foreign body from the posterior section of the eye.

If the prophylactic treatment may offer difficulties, the difficulties in connection with the treatment of an actual sympathetic irido-cyclitis are still greater. The first thing to do, as soon as ever any circumcorneal injection or loss of gloss of iris surface shows itself in the second eye, is to use atropine freely until the pupil is widely dilated. If this should be followed by increased tension of the eye, it is not advisable, as in other forms of iritis, to stop the atropine.

The tendency for the pupil to become entirely blocked by exudation is so great, that every effort must be directed to keeping it as wide as possible. The tension must be combated in another way. I believe the best way to do this, under the circumstances, is to perform sclerotomy. This is preferably done by means of a peripheral incision with a triangular-shaped keratome. Iridectomy should not be done at first, but the sclerotomy, which need not be very large, may be repeated several times.

On the cessation of the inflammation, which usually lasts for months, and after the eye has been quiet for some weeks, a large iridectomy should be made. Even then there is a great chance of the aperture made becoming occluded. When this happens, and after the eye comes to rest, if it still retains some vision, even if it merely be perception of light, the best thing to do is to remove the lens through an incision, as if for cataract extraction, made along the corneo-scleral margin.

Even this does not always result in a permanently open pupil. It may then be necessary, after a further period of inflammation, followed by quiescence, to perform an iridectomy, cutting through the matted-down iris and organised exudation with a sharp knife or scissors made for the purpose. In this way I have sometimes succeeded in restoring a useful amount of vision after a long period of practical blindness. In many cases, degenerative changes have supervened, following upon continued inflammation, before this amount of interference is possible.

Medical treatment is of little use. Mercurial inunction should be tried, and the pain, when it is present, may be allayed by hot sponging and antipyrin.

(*To be continued.*)

MEDICAL BIBLIOGRAPHY AND MEDICAL EDUCATION: DR. ROBERT WATT'S LIBRARY FOR HIS MEDICAL STUDENTS IN 1812.

By JAMES FINLAYSON, M.D., *Physician to the Glasgow Western Infirmary, and to the Royal Hospital for Sick Children; Honorary Librarian to the Faculty of Physicians and Surgeons, Glasgow.*

WHEN I wrote "An Account of the Life and Works of Dr. Robert Watt, Author of the 'Bibliotheca Britannica' (London, 1897)," I stated that I had been unable to find, anywhere, a copy of his medical catalogue.[1] A few months ago I saw this little book, bound up with a miscellaneous lot of pamphlets, in the catalogue of a second-hand bookseller in Glasgow, and I secured it at once for the Faculty Library.

The method pursued by the great bibliographer in teaching medicine is worthy of notice, even at the present day. He says:

"The reading of the student is too often confined to systems, and to compilations, which are generally the works of men of no experience, or of men writing under the influence of preconceived opinions. By the first, materials of little value are as readily selected as those of real importance; while by the last, only such facts are recorded as go to support a particular theory. To obtain correct views in medicine, it is necessary to have recourse to original authors, to such as write from actual observation, who have seen and treated the diseases they describe.

"Many students, however, are neither possessed of such works, nor have they access to them. To remedy this defect, the present plan of establishing a library is undertaken, and it is hoped that it will meet the approbation of those for whose benefit it is intended.

"In my lectures on the Practice of Medicine, after considering the history and treatment of each disease, I give a list of the best authors who have written on the subject, and I now put it in your power to peruse these authors, to examine their facts and opinions, and to draw your own conclusions" (pp. 5, 6).

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[1] "Catalogue of Medical Books, for the use of Students attending Lectures, on the Principles and Practice of Medicine, with an Address to Medical Students on the best method of prosecuting their studies, by Robert Watt, M.D., Member of the Faculty of Physicians and Surgeons of Glasgow, Member of the London Medical and Chirurgical Society, etc., and Lecturer on the Principles and Practice of Medicine in Glasgow," 8vo, Glasgow, 1812, pp. 69.

He goes on to combat the idea that ancient literature is useless.

"An idea has too generally prevailed, that there is little useful knowledge to be derived except from writers of the present day. . . . After having suffered ourselves to be more or less diverted from the true path of inquiry, by the dreams of enthusiasts and the reveries of system-mongers, we are glad to resume our march in the road which Hippocrates and Sydenham traversed with such signal caution and success. By comparing the practice of the ancients with modern improvements, we shall learn to appreciate justly the value of the latter. By marking the errors into which our predecessors have fallen, we shall be enabled to pursue, more steadily, the right method of research" (p. 7).

Watt's catalogue represents, for its time, an admirable collection of books in all departments of medicine. It consists of fifty-one pages, and contains over a thousand entries. The ancient literature of the Greeks and Arabians is well represented, and Celsus and Cælius Aurelianus, of course, are there too. Paracelsus, Van Helmont, Stahl, Hoffmann, de Haen, Boerhaave, Van Swieten, Gaubius, etc., are all there. Works then recent are also entered. Thus we have Baillie's "Morbid Anatomy" (1807), as well as Bonetus and Morgagni; the last, as in many other cases, is in an English translation. Books by Glasgow physicians and surgeons are, as might be expected, well represented; mention may be made of the two important works of Allan Burns, and the various volumes by his brother, Professor John Burns; Dr. Badham on "Bronchitis" (to use the name he invented[1]); Dr. John Riddell on "Fever"; Dr. Richard Millar on the "History of Medicine"; Dr. John Moore's "Medical Sketches"; Cullen's well-known works; and Dr. Watt's own book on "Diabetes" (his book on "Chin Cough" was not published till later). Peter Lowe's "Chyrurgerie" is represented by the 3rd edition (1634). The collection included many volumes of medical journals also. Dr. Watt points out, in a note, that the deficiencies in his list are chiefly as regards books of the last ten or fifteen years, a defect which he was trying to remedy. In addition to the books, he mentions that he had a collection of about 1000 theses, from Edinburgh, Glasgow, and the Continent, which were all available for reference. He further states that "manuscript catalogues, arranged alphabetically according to the author's names and the subjects treated, may be seen in the library, and will be printed as soon as the collection is completed." It has been stated, indeed, that this classification, by authors and subjects, of his own medical library suggested the idea of his great "Bibliotheca Britannica."

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[1] In the "New English Dictionary," Dr. Murray gives priority in the use of the word "Bronchitis" to P. Frank, 1812, noting Badham's book as 1814; he seems, however, to have overlooked Badham's first edition, which was issued in 1808.

Although referring to a somewhat different matter, it may likewise be quoted here, that "Dr. Watt has also made some progress in forming a museum for illustrating the different parts of the animal economy in health and disease"; and he announces that in the meantime, by the kindness of his friend and neighbour, Mr. Allan Burns, he could show from his museum "specimens of many of the most remarkable organic affections."

This method of medical teaching, by the use of a library, does not seem to have been entirely new in Glasgow. When the celebrated Cullen was an apprentice to Mr. Paisley, a Glasgow surgeon, he found the library of his master very useful for himself, as it was unusually good; and when Cullen began his distinguished career as a teacher of medicine in Glasgow, he was able to arrange for his pupils having access to this collection of books. Mr. Paisley, as "Bibliothecarius" to the Faculty of Physicians and Surgeons in Glasgow, was no doubt impressed with the value of having direct access to authoritative books, and with rare generosity he laid his library open to Cullen's students.

The question arises, Might not modern teachers of medicine do well to imitate Watt's method? No doubt, since Watt's time, a great improvement has occurred as regards text-books, which are now produced, at but little cost to the student, by those of high standing and great practical experience; but now, as then, reference to cyclopædic works, to original memoirs, and to special articles in journals, is constantly required for any adequate presentation of certain subjects. Of course, some teachers may say that they present as much of this as is good for the student's stage of education, and some even bring before the students for their inspection copies of great works which have left their impress on medicine. In such matters, however, just as in clinical work, it is of the utmost importance that a student should learn how to go about these inquiries himself; a little found out for himself, as to the literature or history of a disease, counts for more than a great deal told him by a teacher. By the former method, what is supplied is information; by the latter, the student obtains education.

How seldom has a young practitioner even a remote idea of how to prosecute an inquiry into the literature of any subject in which he may be interested, and how apt he is, through such ignorance, to think his case "unique," or his observation original! No doubt these difficulties might be lessened by some regular demonstrations in a fairly good medical library, in which the practical use of catalogues, indexes, and books of reference could be shown. Such demonstrations, just as clinical demonstrations, would have their value; but personal investigation (carried on, it may be, in a tentative or blundering manner) is the only way to acquire any real mastery of the situation, either with books or patients.

Professor Osler of Baltimore tells me that, in the case of a senior student, he may give such a subject as Graves's disease, and request him, in two or three weeks, to bring up a very short verbal account of the literature or history of the subject, explaining who Graves was, and where and when he described the affection; and in the same way as regards Basedow. Owing to their proximity to the great medical library in Washington, with its index-catalogue, his students have no doubt certain advantages. The information thus acquired, and communicated, it may be, from one student to another, is apt to be better assimilated than if it came from the professor. The student thus finds his way to original sources of information, and learns much in the process in addition to what he is searching for.

In my own cliniques I have not gone so far or so systematically in this direction as Professor Osler, but I have sometimes made a demonstration of the leading books, in various languages, on children's diseases, or physiognomic diagnosis, for example, placing them on the table for personal examination. Occasionally, I make a student read aloud from the original treatise the description (for example) given by Sydenham of Chorea Sancti Viti; and I have given Hecker's book to a clinical clerk, and asked him to bring up by and by a short verbal report of the differences or relationships of the dance of St. John, the dance of St. Guy, and Sydenham's chorea, when such a case was under his care.

I think, however, it is not often that this can be done in the Scottish schools of medicine. The continual complaint still is, that the student has no time for such work. He is so much belectured that he has not the necessary time to prepare a few minutes' lecture of his own! Professor Osler's students have the enormous advantage that they have *no* systematic lectures on medicine at all, either from him or any one else; all his teaching is by clinical work, or such methods as those referred to. Why should he lecture systematically, when he has done his best in this way by his printed book on medicine?

In Scotland, our medical professors in the universities were formerly tied down by a hard-and-fast ordinance, so that they had to give a hundred systematic lectures in winter and fifty in summer, whether they thought this wise or not. By the new ordinances they were liberated; but no sooner were they free than they seem to have voluntarily bound themselves with the old shackles, with the result that matters are practically unchanged in this respect. The new ordinances ordain only a time limit (five months and two and a half months) for each entire course, laying down no rule as to the number of lectures. The General Medical Council, on which the Scottish Universities are so ably represented, went further: after prolonged discussion, some years ago, they recommended that *systematic lectures should not be given oftener than thrice a week.* So far as the Scottish Universities are concerned, this is a dead letter. Till the student's time is liberated, how can he study? How can he work in laboratories, wards, or libraries? How can he learn the business of his life? In point of fact, he has to learn most of it after his graduation.

No doubt lecturing has advantages of a kind. A system under which the student can give back to the professor, at the examination board, not only the special views but the *ipsissima verba* of the professor, as taken down by dictation, may result in a wonderful percentage of passes and a remarkably high standard of marks! Such a method of lecturing, however, is beneath contempt, and its true value would no doubt appear at any really independent examination.

Even when the professor aims at a higher style of lecturing, his selection of subjects, and the aspects of them taken up, afford indications to the student, which he highly appreciates, in view of the examination being conducted by his professor. Passing this examination is but too often the single aim of the student in his work; anything different from the professor's notions is apt to be regarded as useless or worse.

The question here introduced (no doubt somewhat episodically) is one of urgent importance. In other parts of the kingdom, notably in London and the English university schools, the responsible authorities are alive to the necessity of practical work superseding to a large extent the traditional lecturing system. A succession of brilliant teachers, for two or three generations—not yet quite extinct—has blinded the Scottish Universities to the needs of the times and to the revolution wrought by cheap printing. Practical work and instruction in laboratories, wards, and dispensaries are now the really urgent matters which reading, lecturing, or even demonstrations cannot supersede; but with systematic lectures five days a week the time and energy of the student are used up, and the power or even the desire of learning anything beyond what his professor tells him is apt to be lost. In some schools, indeed, it has been reckoned dangerous to know anything else!

Untrammelled by traditions, the Johns Hopkins University has abolished systematic lectures on medicine. Is it too much to ask the Scottish Universities, under their new ordinances, to conform to the recommendations of the General Medical Council, on which they are so fully and so ably represented?

THE ALLEGED RETARDATION OF THE PULSE IN AORTIC REGURGITATION.

By JAMES MACKENZIE, M.D., *Burnley.*

SEVERAL writers, in describing the pulse characteristic of aortic regurgitation, have noted that the pulse wave has taken longer to reach the radial and other distal arteries in this disease than in health. Henderson appears to have been the first to make this remarkable observation. He wrote: "Each succeeding systole of the heart propels the new wave of blood into vessels too much relaxed to admit of the onward pulse being transmitted with the usual velocity, and thus results a remarkably increased interval between the beat of the heart and the remote arteries;" and he describes the radial pulse as alternating with the systole of the ventricles. Balfour supports Henderson in this observation, and writes: "This delay of the pulse in aortic reflux is invariable . . . the only apparent exceptions being those cases in which the delay is so great that the radial pulse coincides with the ventricular systole immediately succeeding that which has produced it." Broadbent has also detected it, and finds that the loss of time is manifest even in the carotids.

Professor Clifford Allbutt, in his "System of Medicine," has lately thrown doubts on the possibility of the occurrence of this peculiar phenomenon.

Personally, I was disappointed in not being able to detect this delay in the pulse, and six or seven years ago I began to take tracings of the heart movements and of the pulse, in order the more accurately to study this question.

The results of my observations have been to show that there is no more retardation of the pulse in aortic regurgitation than there is in health.

The method employed in the following observations, to ascertain the time lost by the pulse wave in reaching the radial artery at the wrist, has been by recording simultaneously the apex beat and the radial pulse, and the carotid and the radial pulses. These observations have been made on a large number of cases of aortic regurgitation, the disease of the valves originating from a variety of causes (atheroma, rheumatic fever, syphilis). They have been taken at all stages of the disease, from the first appearance of the regurgitant murmur during rheumatic fever to shortly before death, in cases where the murmur has been recognised for years, and the diagnosis confirmed by post-mortem examination. A number of cases have been submitted to repeated observations for periods varying from four to seven years. In each case the results agree with those given here. For comparison, observations have been made on a number of healthy individuals and on patients suffering from different forms of valvular disease.

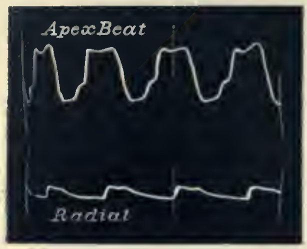

Fig. 1.—Simultaneous tracings of the apex beat and of the radial pulse, from a case of old-standing aortic regurgitation. The difference of time in the appearance of the radial pulse after the apex beat exactly corresponds to that in Fig. 2.

Fig. 1 is from an old-standing case of aortic regurgitation. The upper tracing is from the apex beat, and the lower from the radial. The appearance of the radial pulse occurs at an interval exactly corresponding to the interval between the radial pulse and the apex beat in Fig 2.

This latter tracing was from a case that was demonstrated, post-mortem, to have no lesion of the aortic valves.

Fig. 3 is from the same case as Fig. 1, and demonstrates the interval of time between the appearance of the carotid pulse and of the radial pulse. This period is very slight, and exactly corresponds to the same interval in Fig. 4, which was taken from a healthy youth.

These tracings were taken on a cylinder revolving at a uniform speed.

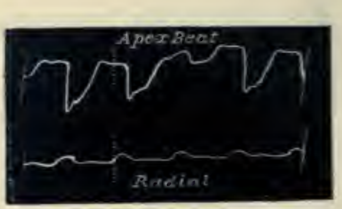

Fig. 2.—Simultaneous tracings of the apex beat and of the radial pulse, from a case in which the aortic valves were healthy.

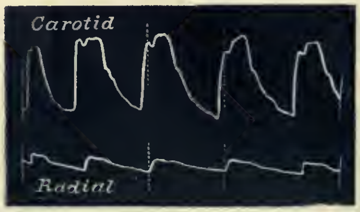

Fig. 3.—Simultaneous tracings of the carotid and radial pulse, from a case of old-standing aortic regurgitation. The difference in time between the carotid and radial agrees exactly with that shown in Fig. 4.

Most of my observations have been made on private patients at their own homes. As I found it extremely cumbersome to use the apparatus with a large revolving cylinder, I devised a method which is as accurate and much more convenient. This method consisted of attaching to a Dudgeon's or von Jacquet's sphygmograph a tambour, in such a manner that the lever of the tambour would inscribe its movements on the same paper and at the same time that a tracing of the radial pulse was being taken. The tambour was connected by an indiarubber tube to a small shallow cup. When this cup is placed over any pulsating part, the contained air conveys the movement to the tambour, and thus we have at once inscribed on the blackened paper the movement of a distant pulsation, with a reliable standard—the radial pulse. The cause of the radial pulse being known, we can refer the varied movements to their different periods in the cardiac cycle.

The von Jacquet sphygmograph is constructed on the same principle as the Dudgeon. It is bigger, and has a clockwork arrangement by which the time is marked in one-fifths of a second. It also possesses the power of running at two speeds. The tracings taken at the more rapid speed, in having the events more widely separated, enables one more readily to judge of the difference in time between the various events.

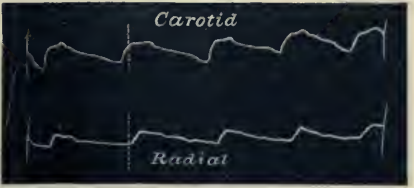

Fig. 4.—Simultaneous tracings of the carotid and radial pulse, from a healthy youth.

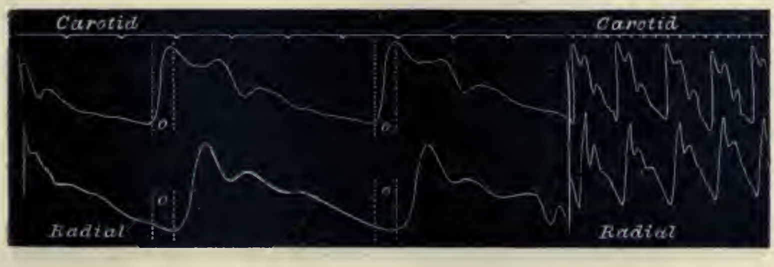

Fig. 5.—Simultaneous tracings of carotid and radial pulses, from a case of aortic regurgitation. The first portion of the tracing was taken when the paper was moving at the more rapid speed. The difference in time (*o*) between the carotid and radial pulses corresponds with that in Fig. 6.

In Fig. 5 there is a simultaneous tracing of the carotid and radial pulse, the first portion at the more rapid rate. This tracing was from a patient whom I had under my care for six years, suffering from aortic regurgitation. He died from heart failure, and at the post-mortem examination the aortic valves were found extremely shrunken. The time lost between the appearance of the carotid and of the radial (*o*) exactly corresponds to the same interval (*o*) in Fig. 6.

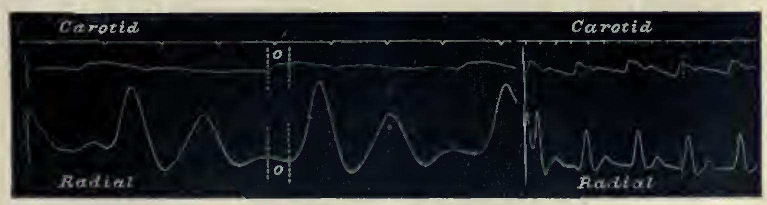

Fig. 6.—Simultaneous tracings of carotid and radial pulses, from a case of phthisis with a healthy heart.

Fig. 6 was taken from a phthisical lad in whom there was no cardiac disease. Figs. 7 and 8 are from the same patients, and show simultaneous tracings of the apex beat and radial pulse.

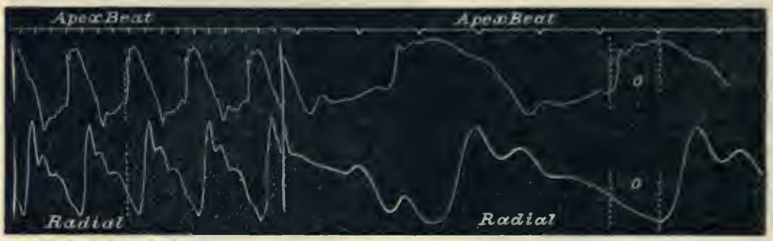

FIG. 7.—Simultaneous tracings of apex beat and radial pulse, from a case of aortic regurgitation. The interval (*o*) between apex beat and radial exactly corresponds to that in Fig. 8.

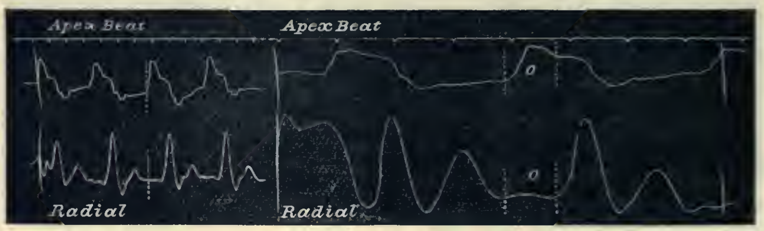

FIG. 8.—Simultaneous tracings of apex beat and radial pulse, from a case of phthisis with a healthy heart.

The interval (*o*) between apex beat and radial is identical in both cases.

In these tracings one can estimate more exactly the actual difference in time, inasmuch as the time is also recorded.

In both Figs. 5 and 6 the interval between the carotid and radial pulse is found to be ·08″.

In Figs. 7 and 8 the interval between the apex beat and radial is found to be ·17″. The time given in physiological text-books is practically the same, namely, the carotid-radial interval being ·074″, and heart-radial interval ·17″. The essential fact, however, is that the intervals are practically identical in both healthy subjects and in patients suffering from aortic regurgitation, and there is no evidence of the extreme loss of time in the appearance of the radial that has been detected by the writers referred to.

In taking tracings of the apex beat, one has to be careful that the instrument is placed accurately over the apex beat. No chamber of the heart gives an outward protrusion during its systole save the left ventricle at its apex. If the instrument is applied elsewhere than over the apex of the left ventricle, the movement obtained is an outward protrusion during diastole, when the ventricular chambers are being filled.

Thus, while taking the tracing represented in Fig. 9, my assistant, in adjusting the instrument, applied it a little internal to the apex beat. It will be found here that the outward protrusion represented by the rise in the tracing does not correspond in its time relation to the carotid pulse, as in Fig. 1. The fall of the heart tracing in Fig. 9 corresponds with the elevation (the apex beat) in Fig. 1; in fact, Fig. 9 is an "inverted cardiogram." It is just possible that observers may have noted this movement in place of the apex beat, as then the carotid pulse would be found to alternate with the movement of the heart. This might the more readily happen, inasmuch as in aortic regurgitation the diastolic filling of the left ventricle is more rapid and forcible, on account of the filling taking place from two sources, namely, from the left auricle and from the aorta.

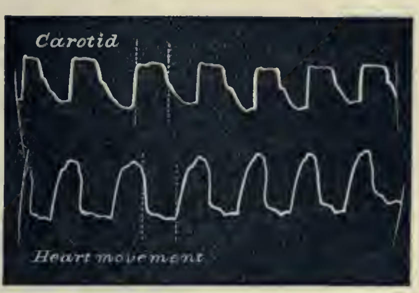

Fig. 9.—Simultaneous tracings of the movement of the heart internal to the apex beat, and of the carotid pulse. The heart movement is exactly the reverse of the apex beat tracing in Fig. 1.

CLINICAL RECORDS.

A FATAL CASE OF ACUTE ARSENICAL POISONING.

By T. N. Kelynack, M.D., M.R.C.P., *Pathologist, Manchester Royal Infirmary, etc.*

(Plate IV.)

As, in consequence of restrictive legislation, acute arsenical poisoning has become comparatively rare in recent years, the following striking case may not be without interest:—

Reuben P., æt. 63, a fried-fish shopkeeper, and his wife Mary, were admitted to the Manchester Royal Infirmary on 12th May, presenting symptoms of acute arsenical poisoning.

Clinical history.—The patients had recently experienced financial difficulties, and rather than face poverty they agreed to die. The agent chosen was "white arsenic," of which they had a quantity in the house, half a pound having been given them about three years previously by a chemist friend, for the purpose of killing rats. Half a teaspoonful was the dose said to have been taken. The wife took her portion at about 2 p.m., and the husband about 3 p.m. They were found at 6 p.m. The woman appeared to be very ill, but when asked what was the matter, stated that she was all right. The man, who was also in a very serious condition, stated that they had taken arsenic. Emetics were administered, and milk and white-of-egg given. The patients were then brought to the Infirmary, and admitted at 11 P.M. The man was in a very collapsed condition, but complained of little pain. The stomach was washed out, dialysed iron administered, and stimulants given, but death occurred at 3.15 A.M. the following morning. The woman recovered, and was able to attend the coroner's inquiry on the 16th, when the jury found that there had been no agreement to commit suicide, and that the deceased poisoned himself whilst temporary insane.

Autopsy.—The body was that of an old man. The stomach was small, contracted, and contained a quantity of semi-digested milk having a sour odour. The anterior and posterior walls were most involved, the lesser curvature and pyloric region being least affected. The mucous membrane was thickened, swollen, wrinkled, or corrugated, somewhat resembling coarse velvet pile. There were numerous areas of red and dark brown hæmorrhagic exudation. Several irregular flakes of membranous lymph had a semi-transparent dirty white appearance, much resembling damp tissue-paper. There was no actual ulceration, and no perforation. The duodenum and intestines were congested, but free from corrosion. The tongue and œsophagus seemed normal. The brain and membranes were much congested and œdematous, with considerable serous effusion into the ventricles. The lungs were slightly congested and œdematous. The other organs presented no features of importance.

A sample of the powder used as the poisonous agent was examined by Dr. Alan M'Dougall, the resident medical officer of the Royal Infirmary, and found to be arsenic. The lesions in the stomach are shown in Plate IV., from a photograph taken by my brother, Mr. W. S. Kelynack.

The case presented many features of pathological and medico-legal interest.

In the first place, as was pointed out at the coroner's inquiry, if two persons agree to commit suicide together, and one only dies, the survivor is guilty of wilful murder. Fortunately, in the present case the jury took a merciful view, and no proceedings were taken against the woman.

Although from the history both took a similar dose, one recovered rapidly, the other dying in a few hours.

In the fatal case, the evidences were curiously limited to the stomach. Generally, the intestines seem to show involvement. Professor Dixon Mann says: "The duodenum generally participates in the appearance presented by the stomach."[1]

The stomach has been added to the pathological collection of the Owens College.[2]

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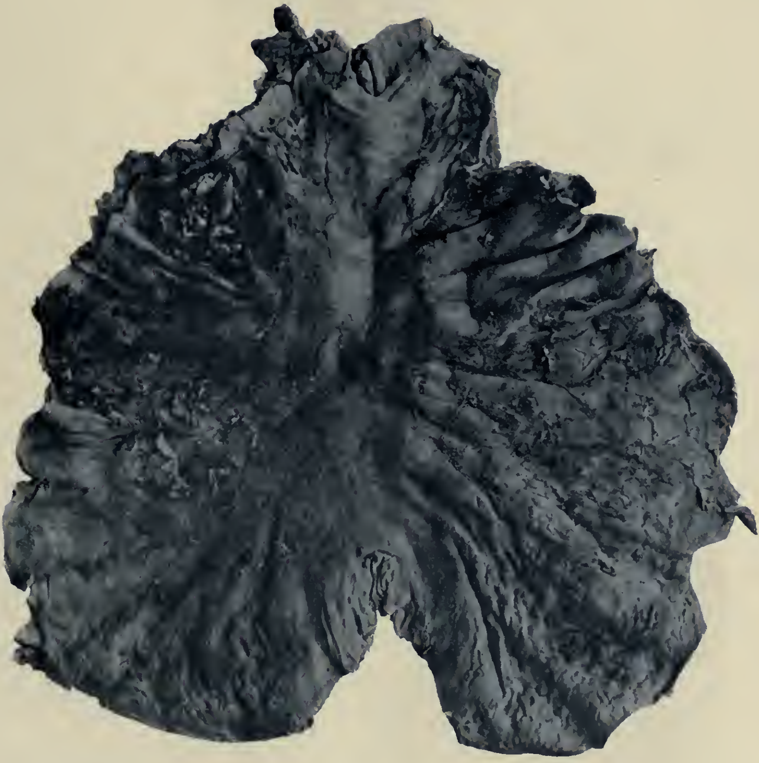
[1] Mann's "Forensic Medicine and Toxicology," London, 1898, p. 452.

[2] The number of specimens in English museums showing the characteristic lesions of acute arsenical poisoning, is very small. For references to preparations in metropolitan hospitals, see Blyth's "Poisons, their Effects and Detection," London, 1895, p. 550.



Stomach showing characteristic lesions of acute arsenical poisoning.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

To Arms! Being some passages from the early life of Allan Oliphant, Chirurgeon. Written by himself; now set forth for the first time by Andrew Balfour, and illustrated by Cecil W. Quinnell. London: Methuen & Co. 1898.

In his letter to Hutchison Stirling, the "Seer of Chelsea" pointed out the great debt which literature owes to the followers of the healing art, and instances might be drawn from almost every age in illustration of the fact to which Carlyle referred. The epoch in which we live certainly furnishes no exception to this statement, seeing that contributions to every branch of literature have, during our own time, been made by members of the medical profession on both sides of the Atlantic.

The work now under consideration is proof sufficient—if such indeed were required—that there are hands ready to bear the torch onwards. That the distinguished family to which the author belongs is possessed of the graceful faculty of adorning a tale has long been known; there is not one of the many thousands who have tramped through Lowlands and Highlands with the genial old Professor of Botany, so often accompanied by his kindly brother (the father of the author), or his son and successor, but is aware of the fact. The gift, however, has in the author of this story reached a point beyond what had ever been suspected. The book is the work of a man who loves his calling, who is steeped in the traditions of his birthplace, and who, as his previous tale proved, has the power of sustaining the interest of the reader in an extraordinary manner. The story is throughout one of action; incident follows upon incident without any lapse into prosy speculation or mawkish introspection. There is, in short, nothing of "*la lassitude de ce siècle finissant*," as Zola puts it; everything speaks of a strong, healthy manhood, dealing with the drama of human life. Once begun, the book cannot be laid aside till finished, so engrossing is its interest.

For us the chief import of the work lies in the fact that it centres in the medical school of this city while it was in its infancy. The general aspect of the old Surgeons' Hall and its surroundings, the hopes and dreams of the far-seeing Professor of Anatomy, the rough and unruly crew over which he held sway—how well they are all handled must be seen at first hand. The author touches with a deft and delicate pen the feelings of a youth about to start on the study of anatomy, paints with realistic force the ghastly details of a "resurrection," and brings up before the reader the harrowing scenes which end the doubtful field of Sheriffmuir. Amid such diverse subjects the author seems almost equally at home.

His pages teem with figures of many a type—some attractive, some repulsive, all interesting. The fair and spirited heroine, the gentle but courageous tutor, the crafty yet cowardly spy, the pusillanimous and superstitious Chevalier,—these and many others are sketched with singular felicity. It is difficult, perhaps invidious, to give any expression of opinion on the relative merits of the characters; the sketch of the versatile, if graceless, Pittendreigh the godless—a Dugald Dalgetty, without the time-serving element—may nevertheless be mentioned as wonderfully entertaining. This tale, when compared with the author's former story, "By Stroke of Sword," marks a distinct advance in the development of his genius, if it is not presumptuous to write thus of one with such a gift, and will, without doubt, achieve even greater success.

G. A. Gibson.

A Manual of General Pathology for Students and Practitioners. By Walter Sydney Lazarus-Barlow, B.A., B.C., M.D., M.R.C.P. London: J. & A. Churchill. 1898.

We have read this book with much satisfaction. Its object is to fill a gap in the modern literature of pathology, and it has succeeded. Existing text-books upon pathology, both general and special, are many, and it might appear to us that, with such able and extensive works already before us, there was little room for a new one of only moderate size. Dr. Lazarus-Barlow has thought differently, and those who read his crisp, clear, and lucid pages will agree with him. Many a student has wondered, on his first introduction to general pathology, what it all means. A mass of details—interesting enough in themselves, but too often without their connecting links and practical applications—is presented to his inquiring mind, and his attention becomes tired and exhausted long before it becomes interested. Experiments upon which the details are based, and theoretical deductions therefrom, are too often entirely omitted, not because the writers think them unimportant or uninteresting, but because of the exigencies of space. Dr. Lazarus-Barlow has in the present work given but scanty notice to the details of pathological anatomy, and wisely so, for these are to be found in plenty in the many existing text-books dealing with the subject. The outstanding feature of his book is the attention he has given to experimental pathology. There can be no doubt that a careful study of this highly important branch of pathology is one of the best modes of educating the student's reasoning faculties. It is to be remembered, however, that his previous training in physiology, the value of which in this respect must be placed upon a higher platform, will have done much for him; and the teacher of general pathology must be careful to hold the scales duly adjusted between the facts of pathological anatomy and the particulars of experimental pathology. After a short introduction, Dr. Lazarus-Barlow first deals with the vegetable micro-organisms, with especial reference to the bacteria. It would be easy to find faults in this chapter; for instance, it might be said that it was too wide in its scope, and too restricted in its particulars; but we have to make proper allowances for the difficulties in treating of this immense subject within the narrow space of the thirty-five pages which the author has allowed himself. A subsequent chapter, which might perhaps with advantage have come nearer this one, deals with the pathology of infection. The two make a harmonious whole. In it he treats of infection, of the types of infective disease, of susceptibility and immunity, of bacterial factors influencing the occurrence of infection, of latency in infective disease, etc. With much the author says, it is easy to agree, and we are further able to admire the ability with which he marshals his facts, and the clearness of his deductions. It is open to question, however, if he has not given too much prominence to types of infective diseases, careful though he has been to point out that such a type is not a constant factor. It is indeed true that some bacteria grow and multiply locally without gaining access to the blood and tissues, while others readily do gain this access, but the wisdom of placing them in separate types may be doubted. Thus, a streptococcus which produces merely a local inflammation may, on its virulence being exalted, produce a rapidly fatal septicæmia. Again, the author says, the type of infective disease is not the same in all animals. This is true; but we have again to remember the influence of the virulence in this relation, for, as Knorr has shown, streptococci, on being inoculated in series through a number of mice, acquire increased virulence for these animals, but become less virulent for rabbits. His chapter on the heart and pericardium is an excellent one, the physics of pericardial pressure especially being clearly explained. Tachycardia, bradycardia, intermittence, and irregularity have all been touched upon. Interesting chapters have been devoted to the blood vessels, and to the blood corpuscles, and the anæmias respectively, but that upon the blood plasma, œdema, and absorption is the most extensive and readable of them all. Considerable space has been given to the problems of osmosis, œdema, and absorption, but the reader will not regret this. Special mention must also be made of the chapters on the pathology of heat regulation and respiration. Both are good, and well up to date. All who read Dr. Lazarus-Barlow's book will extend to it a cordial welcome. Its diction is clear, simple, and forcible.

It is well and logically arranged, and altogether is a book of much merit. While it may prove a little bit above the junior, it will not be above the senior student of pathology. We cordially commend it both to him and to the practitioner of medicine. R. F. C. Leith.

Elements of Histology. By E. Klein, M.D., F.R.S., and J. S. Edkins, M.A., M.B. Revised and Enlarged Edition. London: Cassell & Company Ltd. 1898.

A new edition of this well-known little text-book has just been issued, and the name of Dr. Edkins now appears along with that of Klein on the title-page. The former has practically re-written the chapters on the brain and medulla, and he has also re-edited the chapter on the alimentary canal. There have been numerous additions in other chapters, and a number of photograms from original preparations of Drs. Klein and Edkins have also been included. On the whole the book has been well arranged; but it is, from beginning to end, a description of the subject from the theoretical standpoint alone. The preparations depicted in the illustrations are shown as viewed with a low or moderate magnification, or with no reference to the enlargement at all. This is unfortunate, as a student wishes to know what he can *see* with a special objective. The same spirit permeates the text, as all through the book it is a theoretical account of what is held at the present day to be the structure of the different tissues that is given, and not a description of what can be seen by a low or high power. Of course there are disadvantages in the latter method, as in all others, but perhaps a happier mean might have been struck, as, for example, in Stöhr's "Lehrbuch." The first chapter is a description of the structure of a typical cell and its development, which, although clearly written, is far too short to allow of a proper discussion of karyokinesis. The second chapter deals with blood, and here Kanthack and Hardy's views with regard to the nature of the white blood corpuscles are largely adopted. It is curious that here, as usual, the part which the bone marrow plays in the formation of leucocytes is not referred to.

Chapter iii. gives a description of the different forms of epithelium, more complete than one would have expected after the brevity of the first chapter, at least. It is clearly written, and those forms of epithelium which are not fully described here, receive attention in other parts of the book. There are some points which a number of histologists will scarcely agree with, namely, the regeneration of goblet cells to ordinary columnar cells.

The succeeding chapter deals with endothelium, while Chapter v. takes up the fibrous connective tissues. Here there are some points which admit of controversy. For example, in connection with the pigment cells in the skin of fishes and amphibians, darkness is spoken of as the stimulus, while sunlight is regarded as leaving the cells in the passive state, the skin appearing in the former condition light, in the latter dark. Now, although Brücke and Hermann have described this as occurring in certain animals, as a rule light has the opposite action. As Bimmermann pointed out, the light may either act reflexly or directly upon the cells. Again, the fibres of connective tissue, elastic as well as white, are regarded as developed within the cell protoplasm, a view that is not at present generally held.

Chapter vii. treats of the structure and development of bone. The periosteal formation of bone is termed here intermembranous instead of intramembranous ossification. The description of development of bone is clearly given, and can be easily understood by the reader. The chapter on striped muscle has been largely re-written, and the description is based upon the work of Rollett and Rutherford. The changes which the muscle fibrils undergo during extension and contraction might have been better explained at that part of the text next to the semi-schematic representations taken from Professor Rutherford's paper. The explanation of the nature of Hensen's line is not that given in the paper just mentioned, although it is given as Rutherford's view.

Of the other chapters, special attention may be drawn to that on the lymphatic vessels, which is an exceedingly good one.

The nature of Hassall's corpuscles of the thymus gland, as generally accepted, is not that given by the authors; but the general description of the lymphatic glands is good. The chapters on the nervous system are very good, only some may think that in such a small text-book, one quarter of the whole ought hardly to have been assigned for the description. Dr. Edkins has made good use of the second volume of Kölliker's "Gewebelehre," both with regard to text and figures, with the result that he has given us a clear general account of the present-day knowledge of the minute anatomy of the central nervous system. The chapters on the alimentary canal are almost all that can be desired, when one takes into consideration the space at the writer's disposal. The chapter on the spleen is unfortunately far from being a good one, and the figures given certainly do not do much to explain the text. The nature of the splenic pulp is not properly described, nor are the Malpighian corpuscles. The splenic ellipsoids are not even mentioned.

In the chapter on the male genital organs, spermatogenesis is not nearly fully enough described. The sections dealing with the female genital organs and mammary gland are good. In the chapter on skin a better description of hair follicle might have been given, stating, for example, which part of the epidermis Henle's and Huxley's layers respectively represent. The chapters on the eye, ear, and nasal mucous membrane are very good, although, of course, there are many points which admit of controversy. The description of the ductless glands, although very short, is good.

Although reference in this review has been made to a few points which might admit of improvement, it does not imply that the book has not been very carefully written. A short account, such as this book offers, necessarily must contain a number of statements which cannot be universally accepted, but, as a student's text-book, it will be found to be most useful.

T. H. Milroy.

Forensic Medicine and Toxicology. By J. Dixon Mann, M.D., F.R.C.P. Second Edition. London: Charles Griffin & Co. Ltd. 1898.

This book achieved a well-deserved success in its first edition, because in many respects it offered to medical men and students a clearly written, compact manual on forensic medicine and toxicology, in which recent investigations bearing upon both of these subjects had been carefully digested and incorporated.

The classical works of Taylor and Casper still remain unsurpassed as authorities on the chief questions of criminal jurisprudence; and in regard to the descriptions given by them of the various forms of violent death, there is little which modern investigation has tended to alter.

The writings of Brouardel, Liman, Hofmann, Lesser, and others have placed the science upon a more rational basis, by affording an explanation of many of the appearances which were recorded by older writers, and by estimating the true value of many signs associated with various forms of violence and death. In this connection may be instanced the subpleural ecchymoses, which Tardieu regarded as diagnostic of death from asphyxia, but which are now admitted to have no such diagnostic value; or, again, the investigations of Hofmann in regard to the post-mortem appearances presented by bodies.

While, therefore, it is true that such works as those of Taylor and

Casper will still maintain their place as books of reference on the main facts of forensic medicine, yet it is essential that any book dealing with the subject in the present day should take notice of those investigations which have tended to prove the value of observed facts, and explain them in a rational and scientific manner.

The volume under review shows that the author has consulted the most recent literature on the various subjects discussed, and, on the whole, there are few statements to which exception can be taken.

The criticism one feels inclined to pass is, that the book is unequal in merit. Part iii., which deals with toxicology, is excellent; and Part ii., treating of insanity, gives us as fair a résumé of the subject as is perhaps possible within the limits of a book not specially devoted to the subject; while Part i., which treats of forensic medicine as distinguished from the above, indicates a certain want of *practical* acquaintance with this branch of the subject, and that experience which is only acquired by constant observation at the post-mortem table.

Some of the subjects might well have been treated in more detail, as, for example, the description of the hydrostatic test. This is one of the most important operations with which a medical man has to deal in medico-legal practice, and, in our opinion, the author does not lay down with sufficient minuteness the procedure which ought to be strictly followed in all cases of suspected infanticide. It is not stated that each lobe of the lung should be dealt with separately: this is advisable, as only the pieces of one lobe may float, and if the lung be simply divided into a dozen pieces, as advised, it will be impossible to determine afterwards to which lobe those portions that floated belonged. It is questionable whether dividing the lung into a dozen pieces is sufficient, many authorities holding that a greater subdivision should be carried out. A detail in the procedure, but one of considerable importance, to which allusion is not made, is that before proceeding to apply the hydrostatic test, and after a careful examination of the external appearances presented by the lung, the bronchi should be carefully examined for any foreign particles which may be present.

With reference to gunshot injuries, the distinction between the appearances presented by wounds caused by the old muzzle-loading pistol and the modern revolver with its cartridge are not sufficiently dwelt on. Nowadays it is rather the exception in suicidal revolver-shot injuries to find the appearances which in older books are laid down as characteristic of pistol-shot injury, and it ought to be emphasised how slight the external appearances may be in cases where revolvers are discharged in close proximity to the body.

Part iii., dealing with toxicology, gives an excellent account of the various poisons which may be met with, including several which have become popular in recent years, and of which older books contain only meagre details.

The methods described for the detection of the poisons are clearly stated and accurate; and, so far as this portion of the book is concerned, we are of opinion that it offers to the student one of the best descriptions of poisons to be found in any of the English text-books of medical jurisprudence.

The statistical tables of poisoning which have been added to the present edition will increase its usefulness as a book of reference. These show clearly how popular carbolic acid has become as a cause of death in suicide and from accident, and strongly supports the well-known contention of the author, that some restriction should be placed upon the sale of this poison. At present carbolic acid stands at the head of the list of poisons causing death in cases of suicide, and is only exceeded in cases of accidental poisoning by lead, opium, and chloroform, in all of which there exists special reasons for the frequency of accidental death resulting from their use.

Harvey Littlejohn.

Guide to the Clinical Examination and Treatment of Sick Children. By John Thomson, M.D., F.R.C.P.Ed. Edinburgh: William F. Clay. 1898.

In his preface Dr. Thomson says that "the scope of this book is essentially supplementary," and, having carefully read it, we have come to the conclusion that the book forms a most valuable adjunct to the ordinary text-book of medicine, and also an excellent guide to the practitioner. The first chapter deals with the growth and development of the child, with certain anatomical peculiarities special to children, and with the subjects of speech, sleep, and the development of the sensory functions. It is a section which gives much information, important to the practitioner who wishes to successfully treat children's diseases. Chapter ii. deals with the teeth and dentition subjects, about which many fallacious and harmful ideas are often entertained, and we are glad to see that the author utters a warning against the common habit of ascribing so many infantile ailments to teething; but at the same time he does not fail to rightly describe a list of complaints as being associated with, but not caused by teething. From this list we are somewhat surprised to see that Dr. Thomson leaves out the enlargement of the glands at the angle of the jaw, so common in a baby cutting its teeth. Again, in his description of Hutchinson's teeth, he does not say that it is probable that their presence or absence depends on whether the child has or has not had syphilitic stomatitis. The description of the general clinical examination of the child is good, and the author lays stress on the fact that, in a child even more than in an adult, an accurate diagnosis depends on a complete physical examination of the patient. The next few sections deal with the examination of particular regions, the head and neck being considered first. We are glad to see that the author holds the opinion that craniotabes is, as a rule, merely a manifestation of rickets, but that undoubtedly the most severe cases occur in children who are rickety but also syphilitic. It would have been well, in enumerating the causes of enlarged cervical glands, to have expressly mentioned the frequency of the association of enlargement of the glands at the angle of the jaw with the presence of adenoid growths in the naso-pharynx. In the description of the examination of the abdomen, we note that no mention is made of the importance of, in many cases, feeling for a commencing psoas abscess, for swelling about the vermiform appendix, or for enlarged iliac glands.

One of the most valuable chapters in the book is that on the feeding of infants and children. The author treats the question in a concise and practical, and at the same time a scientific manner, and his remarks are worthy of being carefully read and thought over. We may safely say that Dr. Thomson has written a book which has great and obvious merits, and which should be widely read. LEONARD GAMGEE.

Atlas of Methods of Clinical Investigation. By Dr. CHR. JAKOB. Authorised Translation from the German. Edited by AUGUSTUS A. ESHNER, M.D. London: The Rebman Publishing Co. Ltd. 1898.

THIS is an English version of a book which in its original form has already met with a very favourable reception in this country. It is Volume xv. of Lehmann's well-known "Hand Atlases of Medicine," and with the same author's "Atlas of Diseases of the Nervous System," which, if we mistake not, has also appeared in an English form, completely covers the ground of clinical medicine. We know of no work to equal this in its special line, in the number, the accuracy, and the usefulness of its coloured illustrations. The various appearances of the blood, the sputum, and the urine, in health and disease, are very beautifully as well as faithfully reproduced.

The series of illustrations representing the physical signs of diseases of the chest and abdomen are of great practical value, and ought to be most helpful to the student. The book, however, is not simply an atlas. There are 259 pages of letterpress, in addition to the descriptions of the illustrations, and a thoroughly practical though necessarily brief account is given of clinical methods of investigation.

The translation is on the whole well done, but is somewhat unequal. Although the editor says an endeavour has been made to convey the spirit rather than the language of the original, we think the English version bears too strong evidence of its Teutonic origin. Some curious mistakes have crept in. The note to the description of Fig. 2, Plate i., is quite unintelligible—"The relation between the white and the red blood corpuscles will be correct if the field as portrayed be conceived to contain three times as many red blood corpuscles as white, the number of white remaining as in the illustration." The original puts it quite clearly—"The proportion will be correct if the field be supposed three times larger and filled in with red blood corpuscles, the number of white remaining the same." The description of Plate xxx. is quite wrong as it stands, simply because the translator throughout has used "left" instead of "right." The error has probably crept in through a mistranslation of "In ähnlicher Weise wie der Patient der Tafel xxix.," as "The patient whose case is illustrated in Plate xxix."

We were a little puzzled at finding "bran" mentioned as diet for diseases of the stomach, until, consulting the original, we found it was the translation of "Hirn." "Squab" is not a very well-known article of food in England, but it is the translation of "Taube," and so we suppose means "pigeon."

We may add that we miss the diphthong in this book, and its absence causes many words, such as "edema," "esophagus," "egophony," "feces," etc., to appear unfamiliar. HECTOR MACKENZIE.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,
MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

Clinical Tests, Methods, and Signs—*continued.*

The Pulse.

Ducceschi (*Gaz. d. osp.*, Milano, 1897, tomo xviii. p. 82) especially treats of the pulsus bigeminus. After discussing the various theories which have been advanced by former writers, he concludes that the bigeminal pulse and the other similar forms of disordered rhythm are due to abnormal states of the myocardium. In the *Dublin Journ. Med. Sc.*, Kinnear describes a case in which the number of cardiac contractions fell to six per minute, one every ten seconds, after a stage during which every third beat was followed by a pause of ten seconds. The phenomenal rate of six beats per minute lasted about six or seven hours, and was accompanied with feelings of faintness, with "rushing, surging" sensations in the head at each beat. He recovered satisfactorily. Hayem (*Presse méd.*, Paris, July 6, 1898) notes a case of paroxysmal tachycardia, with gangrene of the hand and forearm. The patient, a man æt. 51, was subject in infancy to convulsions, in later years to bronchitic attacks, and finally to crises similar to those caused by asthma, but really due to cardiac disturbances. These crises at first were only shown by feelings of suffocation, occurring on exertion, ceasing with rest, and unaccompanied by palpitations. Later on, violent fits of palpitation, seven to eight minutes in duration, commenced along with the respiratory symptoms, ending on the appearance of sweating. Between the attacks no cardiac disease could be detected; but the pulse-rate was rapid (90 to 126), thread-like, and badly filled. This rate reached to 200 to 250 during an attack, lasting for from one to one and a half hours, accompanied by severe præcordial pain and total suppression of urine. Urine was usually passed five or six hours after, in a cloudy and slightly albuminous condition. After one prolonged attack, the patient slept with his head on his left arm, and awaking, found the hand and fingers swollen and tingling. The crises now became fewer in number but longer in duration, while his left hand and arm gradually acquired a cyanotic tint, and in time became entirely affected with dry gangrene. The case is used as an example, upon which is based a brief survey of the actual disease as at present understood.

Paroxysmal tachycardia is characterised by three principal phenomena:—1. Enormous acceleration (up to 300) of the heart-beat during definite crises. 2. Great diminution of arterial tension, with a pulse of very small volume. 3. Changes in bulk and character of the urine.

In addition, no organic lesion appears to be connected with the attacks. At the end of the crises, two or three strong, slow beats occur, and the pulse becomes normal again. In addition to traces of albumin, glucose had been temporarily found in the urine. The skin is pale, if the attack is prolonged, owing to the contraction of the arterioles; to the same cause is due the cerebral symptoms of vertigo, restlessness, and the like. The temperature might rise 2° or 3° C., and the pupil be contracted. Breathing is calm, dyspnœa now and then observed. The length of the crises are very variable, varying in different subjects, or in the same at different stages of the disease. Debove and Boulay have described three periods in the more prolonged attacks:—

First period.—Tachycardia without asystole; in some patients constitutes the whole of the attack.

Second period.—*Idem*, with asystole from cardiac fatigue; tricuspid incompetence from dilatation; dyspnœa, enlarged liver, ascites; temporary, may become permanent if attacks are both long and frequent.

Third period.—Decline; of short duration; pulse abruptly falls from over 200 down to 70 to 60 beats.

As to the etiology of this interesting disease, many suggestions had been made. The probabilities were in favour of a central lesion affecting the "bulbo-protubérantiel" roots of the sympathetic nerves. Amyl-nitrite was the only drug which proved of any service. In a postscript he notes the gradual enfeeblement, and finally the death, of the patient. An autopsy was refused.

In the *Pacific Med. Journ.* for June 1898, some notes of a most remarkable and visionary character are made by Purdon, who asserts and believes in sympathetic and telepathic pulse-tracings. The author is evidently convinced that the sphygmograph often indicates the occurrence of sympathetic influence, exercised by one person and felt by another; the ordinary pulse of the one altering to the type of the other on such occasions. The author has taken innumerable sphygmograms, and founds his theory upon the resemblance of tracings obtained from different persons. No tracings are given; the sphygmograph used is not named; the pressure, whether great or small, is not recorded; while a strong nervous strain pervades the paper. What of the observer?

Riegel (*Ztschr. f. prakt. Aerzte*, Frankfurt a/M., 1st Nov. 1897, quoted *Policlin.*, Roma, Suppl., 1897, No. 28) counted fifty-four pulsations of the radial artery of a patient with chronic myocarditis, while the cardiac contractions were double that number; and points to the importance in all cases of slow radial pulse, of corroboration by auscultation or palpation of the heart. Pezzetti (*Bull. d. sc. med. di Bologna*, 1897, tomo iii.) reports a case where complete arrest of the radial pulse accompanied a very full inspiratory effort. Last year Hofmeier

(*München med. Wchnschr.*, 27th Jan. 1897) analysed the relations between nervous cardiac ailments and cardiac murmurs. He ascribed the murmurs common in neurasthenics, in cases of bradycardia and tachycardia, etc., to central nervous lesions especially, involving the nuclei of the vagi in the medulla. Kisch (*Berl. klin. Wchnschr.*, March 1897) associates symptoms of cardiac oppression, which he says are common to hard-worked officials of between 30 and 50 years in age, with cardiac inefficiency. With no history of alcoholic, tobacco, or sexual excess, the symptoms are connected with the great mental strain inherent in all high official positions, and consist of a rapid pulse at all times (80 to 100), rising higher (140) in intermittent attacks, which also are accompanied by lessened blood pressure and dilatation of the arterioles. The pulse may be extremely irregular (*delirium cordis*). Rest, good food, heart tonics, along with chalybeates, are the indications given for treatment.

Tedeschi (*Riforma med.*, Roma, May 1897) points out the frequent coexistence of attacks of cardiac arhythmia with gastric and intestinal maladies. He ascribes them to auto-intoxication, and divides them into three classes—(1) Sudden, brief, vertiginous arhythmia; (2) more prolonged change of rhythm; (3) paroxysmal arhythmia, simulating angina pectoris.

Other papers upon variations of the pulse are as follows:—Silva, *Med.-Chir. Centralbl.*, Wien, Nov. 5, 1897; Ruedi, *Mitth. a. Klin. u. med. Inst. d. Schweiz*, Basel, 1895, Bd. iii. S. 5; Herz, *Verhandl. d. XIV. Cong. f. innere Med.*, Wiesbaden, 1896; and *Wien. Klinik*, 1896, S. 6 and 7; Heitler, *Wien. med. Wchnschr.*, 1896, Bd. xlvi. S. 13; Gerhardt, *Berl. klin. Wchnschr.*, 1897, Bd. xxxiv. S. 1 and 14; Roether, *Schmidt's Jahrb.*, Leipzig, 1897–98, etc.

THE STOMACH.

RECENT INSTRUMENTS.

BOARDMAN REID (*Phila. Med. Journ.*, 26th March 1898) figures an intragastric electrode, which he has devised as a modification of Einhorn's electrode and Ewald's variant of the latter. The bulb is of smaller diameter, and tapers very gradually into the soft rubber tube carrying the wires, thus allowing it to be easily swallowed and easily removed. The wire used is stronger and firmer, and is doubled near the lower end, permitting active propulsion to aid the patient's voluntary deglutitary efforts.

Turck (*Journ. Am. Med. Assoc.*, Chicago, April 23, 1898) describes an intragastric reagent capsule, a small gelatin capsule, containing a portion of rubber tubing weighted with two small shot and connected with a silk thread. In slits of the rubber tube are introduced strips of Congo-red, dimethyl-amido-azo-benzol, and neutral litmus papers. These are folded up within the capsule; but, when the gelatin melts in the stomach, unfold in the gastric contents, and can thus be recovered, and their colour observed.

Gross (*New York Med. Journ.*, April 23, 1898) publishes an account of his stomach tube, as recently altered and simplified. It is easily carried in the pocket, although rather more elaborate than the ordinary form. It consists of a rubber hot-water bottle, in shape like an ice-bag, attached by an air-tight screw to a soft rubber stomach-tube, which is in one piece, but has a double channel; the outer canal, perforated at its lower end, conveying the warm water from the bag; the inner, the contents of the stomach through a specially attached tube, furnished with an aspirating bulb. To pass water into the stomach, all that is required is to place some weight, books, bricks, etc., on the closed water-bag and open the screw. The water enters in a fine spray, while the efferent tube constantly keeps the stomach empty. The spray thus produced is said to act with more power and benefit.

A modification in the manner of use of the œsophagoscope forms the subject of an article by Einhorn (*ibid.*, 11th December 1897). He has abandoned the use of the flexible instruments straightened *in situ*, such as suggested by Rosenheim and Kelling, and gone back to Mikulicz's rigid œsophagoscope, using a panelectroscope in combination with it.

Kirstein also (*Berl. klin. Wchnschr.*, 4th July 1898) deals with this instrument, preferring one shaped like an enlarged urethroscope. The lower end is not larger than the tube, and is made of metal alone. Kirstein is unable to agree with Mikulicz and Leiter that the normal human being is well adapted for sword-swallowing. (In this country the proportion of possible artistes in this line must be much smaller than even Kirstein allows for Germany.)

Kühn (*Arch. f. Verdauungskr.*, Berlin, 1897, Bd. iii. S. 1; *Deutsche med. Wchnschr.*, Leipzig, 1897, Bd. xxiii. S. 36; and *Centralbl. f. innere Med.*, 1897, Bd. xviii. S. 25) explains further the use of his spiral-metal-sound for both stomach, pylorus, and duodenum.

Kuttner (*Verhandl. d. XV. Cong. f. innere Med.*, Wiesbaden, 1897), Kelling, Oppler, and Meltzing (*Arch. f. Verdauungskr.*, Berlin, 1897, Bd. iii.) express varied opinions as to transillumination through the stomach walls. The first and fourth find it of considerable use, the other two do not think much of it. Meltzing obtained accurate corroborative results of this method by introducing a magnet at the end of a sound, and studying the movements of a polarised needle placed outside.

Merkel (*Med. Cor.-Bl. d. württemb. ärztl. Ver.*, Stuttgart, 27th August 1898) gives details of four cases examined with Rosenheim's œsophagoscope.

See also Kelling (*Arch. f. Verdauungskr.*, Berlin, 1896, Bd. ii. S. 3); Rumpel (*München. med. Wchnschr.*, 1897, Bd. xliv. S. 15); Jaffe (*ibid.*, S. 15).

SURGERY.

UNDER THE CHARGE OF

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Treatment of Subclavian Aneurysm.

In reporting a case of subclavian aneurysm, treated by excision of the sac, Mr Moynihan, of the Leeds General Infirmary, makes a number of interesting observations on the treatment of aneurysm in general. He maintains that a patient subjected to excision of the sac, as compared with the Hunterian ligature, has (1) a far greater chance of recovery from the operation; (2) no risk of recurrence; (3) a far less risk of gangrene; and (4) a probable complete recovery from the various affections due to nerve interference. Mr Moynihan's own case was that of a man, æt. 31, with an aneurysm of the third portion of the right subclavian artery; the sac was exposed by reflecting a large skin-flap and by displacing the middle portion of the clavicle; catgut ligatures were applied to the second portion of the subclavian and to the first part of the axillary arteries; the sac was then removed. On the fifth day the temperature rose to 104°, and the skin in the region of the wound was inflamed; the patient was supposed to pass through an attack of erysipelas. He made a good recovery, however, and appeared to be quite "out of the wood" until the fifty-ninth day after the operation, when he complained of something having burst deep in his neck; the flap raised at the operation was found bulged outwards, the scar to have reopened, and blood trickling from it. On opening up the wound, a terrific hæmorrhage occurred from a fresh aneurysm, which had formed on the subclavian artery about 1 in. from its ligatured extremity, and which had ruptured. The only hope lay in immediate ligature of the innominate artery. This was carried out by a flap operation, in which the inner end of the clavicle and a portion of the upper end of the sternum were displaced upwards. The hæmorrhage was arrested at once, but the patient died of collapse and loss of blood about one hour after the completion of the operation.

It is quite reasonable to suppose that if there had been no septic complication attending the original operation, the patient would have made a complete recovery.—*Ann. Surg.*, Phila., July 1898.

HERNIA OF THE BLADDER.

F. **Brunner** has collected all the published cases of hernia of the bladder, and has come to the following conclusions. He divides them into three groups, according to the relations which the herniated viscus bears to the peritoneum. There is first an intraperitoneal form, in which the vesical protrusion is entirely covered with peritoneum; secondly, an extraperitoneal form, which is devoid of any peritoneal investment; and, thirdly, a paraperitoneal, in which, alongside the bladder, there is a peritoneal sac, which partly covers that viscus. The third form is by far the commonest. Of the 180 cases of bladder hernia reported, there were five intraperitoneal, eighteen extraperitoneal, and one hundred paraperitoneal; the remainder could not be classified. In five cases the hernia was bilateral; in twelve cases there was a stone in the herniated bladder. A considerable number of the recorded cases are of artificial origin, the result of dragging on the hernial sac during the operation for radical cure; this has been specially observed in femoral hernia. Hernia of the bladder is chiefly found in elderly individuals, in relation to acquired hernia. In the primary forms the protrusion is the result of the bladder being driven through one or other of the hernial openings by the intra-abdominal pressure, or it follows a prevesical lipoma. In the secondary forms it results from the traction on it of an ordinary pre-existing hernial sac, or through the dilated and relaxed bladder, covered with peritoneum, descending into an already existing hernia.

That the recognition of the bladder complication in a hernia is difficult, is shown by the frequency with which the viscus has been unintentionally injured during the operation. The bladder was opened into accidentally in two-thirds of the cases (eighty-one times in 126 operations); of these, twenty-one terminated fatally, death being attributed in thirteen to the injury to the bladder. In twenty-six of those who survived, the wound in the bladder resulted in a urinary fistula, which persisted for periods varying up to four and a half months.

In operating on cases in which there exists a hernia of the bladder, the surgeon's aim should be to reduce the viscus without injuring it. A prevesical lipoma should be excised. If the bladder be accidentally wounded, and the mistake be recognised at the time, the opening should be closed with sutures, and the external wound be left partially open. Should the lesion be not recognised till afterwards, the wound should be reopened, and the bladder dealt with as seems best. Unimportant urinary fistulæ may be left to close of themselves.—*Centralbl. f. Chir.*, Leipzig, 9th July 1898.

Hallux Valgus.

At the recent congress of Berlin surgeons, Heubach read an interesting paper, in which the various views as to the etiology of hallux valgus were criticised *seriatim*. That most generally accepted on the Continent is a primary arthritis deformans of the metatarso-phalangeal joint, originally propounded by Volkmann. Heubach, who has carefully studied the condition of the different elements of the joint removed by operation, upholds the view that the deformity is a mechanical one; the great toe is abducted by the pressure of boots which are too pointed and often too short; in walking, the inner aspect of the head of the first metatarsal bone is subjected to abnormal pressure, and therefore increases in size, while the outer aspect, being relieved from pressure, becomes less. The changes observed on the articular surfaces disprove the theory of a primary arthritis deformans. In the latter, the cartilage first disappears where the joint surfaces are rubbed together; in hallux valgus, on the other hand, the cartilage remains intact wherever the articular surfaces are still in contact with each other, while that on the exposed inner aspect of the head of the metatarsal bone disappears. The absence of bony overgrowth within the joint is also against the theory of a primary arthritis deformans.

Heubach usually practises the complete excision of the joint in hallux valgus, *i.e.* he removes the head of the first metatarsal, the base of the first phalanx and the sesamoid bones.—*Congress of Berlin Surgeons*, 9th May 1898.

OCCLUSION OF THE INTESTINE BY TORSION OF THE ENTIRE SMALL INTESTINE.

AT the Surgical Society of Paris, M. Delbet related two cases of this rare condition. The first was that of a woman, who had suffered for nine days from symptoms of intestinal obstruction. On performing laparotomy, he found the colon and the lowest coil of the ileum collapsed and empty. The other coils of small bowel were distended and twisted. The feeble condition of the patient only allowed of an anastomosis being made between the distended and the collapsed portions. The patient died a few hours later. The autopsy showed that the anastomosis had been effected between the two extremities of the small intestine, that the mesentery had been twisted, and that the lesion consisted in a torsion of the entire small intestine, in the direction of the hands of a watch, amounting to more than one turn. To restore the parts to their normal position, it was only necessary to seize the whole mass of bowel and rotate it in the direction opposite to that of the hands of a watch. The second case was that of a man, æt. 69, upon whom M. Delbet performed laparotomy within nine hours of the onset of the symptoms of obstruction. Finding a condition of affairs similar to that in the preceding case, he brought the entire intestine out at the wound, and untwisted it. The immediate result was favourable; the patient passed flatus, and had a motion. He acquired, however, a broncho-pneumonia, and died on the eleventh day. The direction of torsion, which was similar in the two cases, apparently depends upon the obliquity of the insertion of the mesentery from above downwards, and from right to left. The small intestine is occluded at either extremity, just as in a strangulated hernia; hence the distension of the abdomen is very general and very pronounced; the vomiting can scarcely become fæcal, because the bowel is strangulated at the commencement of the jejunum. In consequence of the venous stasis, there is abundant effusion into the peritoneum. MM. Routier, Kirmisson, Reynier, and Monod had each observed similar cases.—*Rev. de chir.*, Paris, July 1898.

THE AFTER-HISTORY OF BULLETS LODGED IN THE BRAIN.

VON BERGMANN communicated to the Berlin Medical Society his experience of cases in which a bullet had lodged within the brain. He had observed thirty-two cases in which the bullet had been allowed to remain *in situ*. Eight of these died shortly after the lesion with progressive brain symptoms. Two died at a later stage, of abscess in the frontal lobe; and two others, of purulent meningitis. One case was lost sight of. The remaining nineteen recovered; they either presented no symptoms, or were unconscious for a short time and suffered later from localised paralysis or cramps. In a limited number, there was paralysis on the opposite side of one hand or arm, with subsequent contracture. In the group of cases which recovered with cerebral symptoms, there can be no doubt that the bullet had traversed and destroyed brain tissue, and had become encapsuled. That such encapsulation can take place, is proved by the Röntgen photographs which were exhibited at the meeting, and which are reproduced in the paper from which we are quoting.—*Ber. klin. Wchnschr.*, 2nd May 1898.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Conservative Cæsarean Section, with Castration for Osteomalacia.

Salowij (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 25) reports a second case of osteomalacia so treated; his first case now, five years after operation, being cured. He discusses this method of treatment as compared with Porro's operation, but would still limit the latter to cases—(1) Where the operation had to be performed before the onset of uterine contractions, (2) complication with fibroids of the uterus, (3) septic infection of the uterine cavity. Cases complicated with carcinoma of cervix he treats by total extirpation, by a combined vaginal and abdominal operation. Reference is made to a similar case, published by Czyzewicz, who, however, now prefers the Porro operation.

Salowij's second case was a woman, æt. 37, married fifteen years, eight full-time children. Towards the end of the eighth pregnancy, patient complained of a pain in the bones which prevented her walking. Those disappeared after confinement. At the seventh month of her next pregnancy, pains recurred; treated with phosphorus without any effect; the pelvis was so contracted that the diagonal measurement was with difficulty ascertained. The operation was performed in the usual way, and the pains continued severe for the first ten days, but gradually disappeared; so that now, a month after operation, the patient is apparently well. Salowij admits that it is too soon after operation to consider this a case of permanent cure.

On Gloves for Examining Pregnant Women.

Döderlein (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 26) refers to the importance which has been insisted upon, especially by Credé and Leopold, of limiting internal in favour of external examinations, as there are still occasional slight epidemics of puerperal fever in institutions where many students and midwives are instructed, in spite of antiseptic precautions. Döderlein admits all this, but nevertheless thinks that internal examinations are still necessary for teaching purposes, and recommends the wearing of gloves by students and midwives. He first used those of fine thread, as recommended by Mikulicz and Perthes, but discarded them, as they were permeable, interfered with sensation of touch, and were not smooth enough. The elastic gloves of Wölfler were equally useless, and too expensive when used in large numbers. In the last German Surgical Congress, Friedrich exhibited seamless, thin, india-rubber gloves, which are well suited for making examinations. They are—(1) Impermeable; (2) light, and can be sterilised in steam or boiling water, so that they may be used repeatedly; (3) when moistened with lysol solution, they are smooth as the hand itself; (4) not too expensive for general use. Döderlein has used those for some months in his clinic, and does not hesitate to allow as many as eight students examine one case, when wearing those gloves. There has been no case with fever since their introduction, and they do not interfere with touch sensation. Before use, the gloves are boiled for half an hour, and kept in lysol solution.

Absence of Uterus and Vagina, with Sarcoma of One Ovary and Adeno-Carcinoma of the Other.

In the *Am. Journ. Obst.*, N. Y., July 1898, Dr. Ladinski of New York reports a case of the above which came under his observation. The patient was an Austrian, æt. 26, and married, but had never menstruated. For six years she had suffered from pelvic pain, which for six months had been aggravated. Her general development was good, the mammæ also were well developed, the pelvis was normal, and the pubes covered with hair. Her older sister had borne children, but her younger sister had an infantile and retroverted uterus.

On examination, the vulva was poorly developed, clitoris normal; the vagina was represented by a vestibule three-quarters of an inch in diameter and a quarter of an inch in depth, which was covered with a membrane resembling cicatricial tissue. On examination, a solid mass was found filling the pelvis, but freely movable. An attempt was made to create a new vagina and remove the tumour from below. The bladder and rectum were found to be adherent to each other. They were carefully dissected off from each other for about 6 in., when the peritoneal cavity was opened. It was then found that the tumour could not be removed from below, as no pedicle could be felt. The artificial vagina was then packed with iodoform gauze. Thirteen days later the abdomen was opened, when a large, solid, right-sided tumour was removed. On the left side a small, irregular mass was found, which was also removed. On examining the pelvis, neither uterus nor Fallopian tubes could be found. On microscopic examination, the larger growth was found to be an alveolar sarcoma; the smaller growth was an adenoma-carcinoma, and gave evidence of being of ovarian origin, and also contained several small cysts which were considered to be of parovarian origin.

The author sums up as follows:—"The interesting and unusual features of this case are, first, complete absence of vagina, uterus, and tubes; second, the existence of malignant disease of the ovaries together with this anomaly; third, the presence of sarcoma and carcinoma of the ovary in the same individual; and, furthermore, the sarcomatous and carcinomatous degeneration of the undeveloped ovaries, which tends to confirm the theory of the origin and growth of these tumours from embryonic tissue."

THE ADVANTAGES OF VAGINAL SECTION FOR PELVIC SUPPURATION AND CIRCUMSCRIBED HÆMORRHAGE.

DR. E. N. LIELL (*Med. Rec.*, N. Y., June 1898) discusses the advantages of vaginal section over the abdominal method, in dealing with cases of pelvic suppuration and hæmatocele. He has done this operation himself in thirty-four cases, and holds that, while Péan, Jacobs, Segond, and other French surgeons have removed the uterus, along with suppurating appendages, more successfully by the vaginal than the abdominal route, at least in bad cases, that a much simpler operation is in many cases sufficient, namely, vaginal incision and drainage; and also that in some cases, where the latter operation does not effect a cure, the local conditions can be so much improved that the uterus and appendages can be removed at a subsequent operation with less danger to the patient. He has in eight cases operated per vaginam, with the object of breaking down pelvic adhesions accompanied by pain, with complete success in six, the adhesions and pain recurring in two. In the case of pelvic new growths complicated by adhesions, he has for diagnostic purposes operated on six occasions, and been able to demonstrate in two cases that the neoplasm was malignant.

As the procedure requires a sharp eye and a delicate touch, he is of opinion that the operation is only successful in experienced hands. His method is briefly as follows:—After careful asepsis, the uterus is drawn down with a volsellum, and a longitudinal or semicircular incision made in the posterior *cul de sac*, and the finger introduced into the incision with a boring motion; the abscess or hæmatoma is then entered with sharp-pointed scissors and the contents evacuated, care being taken to open and evacuate every pocket, should they be multiple. In nearly all cases the abdominal cavity is protected by a wall of lymph, and in very few cases has it to be opened; but this should always be done if the thoroughness of the operation demands it. "If a pus sac be the case, either tubal or ovarian, and adhesions to the uterus or rectum be present, the adhesions must often be broken up to anticipate the remote as well as the immediate good effects of the operation." The cavity should be swabbed out or irrigated, and loosely packed with iodoform gauze, which should be removed in two or four days, and fresh dressings applied once or twice. If the contents have been thoroughly evacuated and good drainage established, convalescence is usually rapid. Ligatures are seldom required, forceps and torsion being usually sufficient. The Trendelenburg position is the one adopted.

Dr. Liell goes on to record two cases, one of pelvic abscess and another of encysted hæmatocele, the result of ruptured ectopic gestation, in which he operated successfully by the vaginal route.

THERAPEUTICS.

UNDER THE CHARGE OF

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Trional and Blood Pressure.

Kornfield has used trional for over two and a half years, and in two hundred cases of all kinds of insanity (*Centralbl. f. d. ges. Therap.*, Wien, April 1898), and finds that it is, on the whole, a reliable and quickly-acting hypnotic. The sleep is very like normal sleep, and only very rarely did he meet with any ill effects traceable to its use. It acts best clinically in conditions of exhaustion and mental depression, in neurasthenia and melancholia. In such cases and with appropriate doses he was always able to overcome the sleeplessness, and to conquer any terror which might be present. Doses of 15 to 30 grs. were usually sufficient. In conditions of excitement, following on paralysis, the results were not satisfactory; and in acute mania also it was disappointing.

Blood pressure observations, taken with Basch's sphygmomanometer, showed that it always lowered the arterial tension, and often to a considerable extent. Trional acts by depressing the central nervous centres, and along with others the vasomotor centre, and hence the fall in pressure. The action of trional is much more marked if the patient is quiet and not disturbed by pain or excitement. In any case the sleep is never very profound. It has no direct depressing action on the heart or heart muscle.

Cousso Honey.

Menelik, Emperor of Abyssinia, is said to have experienced the value of cousso as an anthelmintic. He fell upon the idea of obtaining the active principle in a pleasant form by means of bees, and accordingly set a large number of hives near some cousso trees (*Brayera anthelmintica*). The insects eagerly sought their flowers, and a tablespoonful of the resulting honey has been found to be a very efficient and pleasant anthelmintic in tape-worm.—*Centralbl. f. d. ges. Therap.*, Wien, April 1898.

Effect of Altitude on the Blood.

Egger (*Arch. f. exper. Path. u. Pharmakol.*, Leipzig, Bd. xxxix. S. 385) has made observations on the blood of men and rabbits at Arosa, about 5700 feet over sea level. In every case there occurred an increase both in red blood corpuscles and hæmoglobin, on ascent to the high altitude. In an average of fifteen days, the average increase of corpuscles was

16 per cent. In cases of oligocythæmia the increase was much the most marked—26–48 per cent.; but some cases of anæmia improved very much less, a fact of great clinical interest.

In rabbits, three to four and a half weeks' stay at Arosa caused a rise of 14–33 per cent. in the corpuscles, but not a corresponding increase in the amount of hæmogloblin, this being accounted for by the large number of undersized corpuscles which appeared. As the stay is prolonged, the number of small corpuscles tends to increase relatively to the large. In natives of Arosa, and in persons acclimatised by a long stay there, Egger found a normal of 6 to 7 million red corpuscles and 18–22 per cent. hæmoglobin, instead of about 5 millions and 13 or 14 per cent. respectively. On descending to the level again, the increase gradually disappears.

METHYLENE BLUE IN NERVOUS HEADACHE, ETC.

E. THOMSON (*St. Petersb. med. Wchnschr.*, 30th May 1898) states that methylene blue is valuable in habitual headache and hemicrania. He gives it in 1½-gr. doses along with equal parts of powdered nutmeg, the object of the latter being to prevent irritation of the bladder. The urine is coloured dark green for some days after, and has a peculiar odour, and occasionally there is a desire to micturate frequently. Otherwise it seems to be quite unaccompanied by unpleasant effects.

Cardamates of Athens (*Therap. Gaz.*, Detroit, July 1898) has also used it in malaria, giving 10 or 12 grs. to adults about ten hours before the rise of temperature is expected. A combination of it with quinine was often found to act especially well, and it is useful in cases where quinine alone has proved of no avail. It is apt to cause cystitis. Immunity to the malarial poison seems to follow on its continued use.

USES OF ORTHOFORM.

ORTHOFORM continues to attract a good deal of attention clinically. Kallenberger has published (*Berl. klin. Wchnschr.*, 1898, No. 28) the results which he obtained from its surgical use, and these may be summarised as follows:—(1) It is a local anæsthetic, if it can be brought into contact with the exposed terminations of sensory nerves; (2) it is absolutely non-poisonous; (3) it is strongly antiseptic. He used it as a powder in fresh wounds and injuries, in burns, simple and cancerous ulcers, syphilitic erosions, and toothache. The pain disappears in three to five minutes; anæsthesia is complete, and lasts from some hours to two or three or four days. It checks also secretions from wounds, and in many cases may advantageously replace opium as an analgesic.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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THE GUAIAC AND PEROXIDE OF HYDROGEN REACTION, FOR THE DETECTION OF BLOOD STAINS IN MEDICO-LEGAL CASES.

SIEFERT (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1898, Bd. xvi., Heft 1), after showing from various authorities that the detection of blood in stains is often rendered uncertain and even impossible under certain conditions, such as when the stain has been exposed to the weather, sunlight, heat, etc., by the microscopic, spectroscopic, and hæmin crystal tests, advocates strongly the delicacy and ease with which the presence of blood can be demonstrated by means of a solution of guaiac and peroxide of hydrogen.

The ozone reaction with an alcoholic solution of guaiac and oil of turpentine has many advantages, but also many disadvantages, amongst the latter being the fact of so many other substances giving the same reaction. So far as organic substances are concerned, Siefert shows that heating the solution to be tested to a temperature of 90° to 100° C. will effectually get rid of any action they may have on the guaiac. The method which he recommends is as follows:—If a *fluid* is suspected to contain blood, it must be evaporated and the residue dealt with. In medico-legal practice, however, one has chiefly to examine stains upon various substances—if on a knife, axe, etc., the stain is carefully scraped and the particles collected in a porcelain dish—if on cloth, the part is cut out and the fibres of cloth separated by a needle. Under all circumstances, the material to be examined is placed in a porcelain dish, and rubbed up with 3 to 6 c.c. absolute alcohol, to which eight to ten drops of concentrated sulphuric acid are added, the contents of the dish, being continuously stirred. By this means a considerable proportion, if not all, of the blood coagulum passes into solution.

The porcelain dish is now placed on a water bath and the contents heated to a state of ebullition, while continuing to stir. The blood is now converted into "hæmatin in acid alcoholic solution." Since other catalytic substances are still present in this solution, and since also an acid solution of hæmatin must be concentrated in order to obtain a distinct blue coloration, it is necessary to convert the hæmatin into an alkaline solution, by means of the addition of a 30 per cent. solution of caustic potash or soda, until litmus paper shows a distinct alkaline reaction. By this procedure also, any iron or copper present is precipitated. The solution is now filtered, and the filtrate neutralised with sulphuric acid.

Hæmatin is insoluble in a neutral solution, and of course is now precipitated, but a small quantity remains in solution, owing to the sulphates of potash or soda which are present as a result of neutralising the alkaline solution; the small amount of hæmatin thus remaining in a soluble form is quite sufficient to produce the reaction, and when the almost colourless solution has been filtered, 2 c.c. of concentrated solution of sodium chloride are added to it, and then 2 or 3 c.c. of (10 per cent.) solution of peroxide of hydrogen. The whole is shaken up, and afterwards, drop by drop, tincture of guaiac added. The guaiac floats on the top, owing to its lower specific gravity, but at its line of junction with the original solution in the test tube, the guaiac forms an emulsion, which either at once, or in the course of a minute or two, becomes intensely blue coloured. The solution of sodium chloride is merely added to increase the specific gravity of the solution and prevent the guaiac at once mixing with it.

Siefert claims that the method can be easily carried out in ten minutes, and that it is reliable, and frequently demonstrates the presence of blood when the result of the spectroscopic test is negative and hæmin crystals cannot be obtained.

THE EXAMINATION OF THE PLACENTA IN MEDICO-LEGAL CASES.

DR. OTTO KÜSTNER (*Vrtljschr. f. gerichtl. Med.*, Berlin, Bd. xvi., Heft 1) thinks that a careful examination of the placenta, in cases of suspected infanticide, will often afford valuable evidence as to the cause of death of the child; that is to say, in those instances where there are no external marks of violence, but merely the internal signs of death from asphyxia, and where the question will arise as to how the asphyxia was produced.

Küstner is of opinion that there are two appearances of the placenta which are of the greatest importance as an indication that the child has been asphyxiated *in utero*, namely, great fulness of the veins on the surface of the placenta beneath the amnion; and, secondly, a green discoloration of the amnion and chorion over the placenta, and of the covering of the umbilical cord, caused by impregnation with meconium, *i.e.* bile-colouring matters, Küstner holding that intra-uterine escape of meconium always betokens interference with the placental circulation or fœtal asphyxia.

THE HISTOLOGICAL CHANGES IN THE ORGANS OF GENERATION CAUSED BY EXPOSURE TO HIGH TEMPERATURES.

FRITZ REUTER (*Vrtljschr. f. gerichtl. Med.*, Berlin, Bd. xvi., Heft 1) with a view to determining whether it was possible to identify by means of the microscope the organs of generation, and thus the sex of persons who had been exposed to great heat and more or less charred, made experiments and came to the following conclusions:—(1) Tissues which have been to a large extent charred, can be satisfactorily examined histologically by suitable methods; (2) the identity of the sex in bodies which have been severely burned can in many cases be made out with certainty, and, as regards the uterus, not only the muscular fibres, but also the characteristic sinuses, with the columnar epithelium of the glands, can be distinguished.

Congestion of the blood vessels and small effusions of blood, as also a general redness of the mucous membrane of the uterus, must not be regarded as necessarily the result of menstruation or pregnancy having existed, since these conditions may arise post-mortem. In the testicle, the epithelium of the tubules was distinguished, and the presence of spermatozoa could frequently be observed.

Reuter draws attention to certain points of special medico-legal interest, which incidentally arose during his investigations, namely, that in all probability the blisters filled with serum, which have been observed to occur post-mortem, on bodies which have been burnt, are caused by the shrinking of the tissues from the heat, and consequent expression of the fluid contained in them towards the surface. In the same way the distribution of the blood in the body may be altered post-mortem, and even given rise to ecchymoses. A peculiar (and apparently hitherto unrecorded) transverse stripping of the connective tissue fibres was found to result when they had been exposed to a certain temperature and were afterwards teased out in watery solutions.

The Distribution of Antimony in the Various Organs of the Body.

Dr. Ciechanowski (*Ann. d'hyg.*, Paris, August 1898) carried out experiments upon rabbits, in order to determine the distribution of antimony in the various organs of the body in acute and chronic poisoning. He employed Marsh's apparatus in the first instance, and made experiments as to the amount of antimony which could be recovered by this process, when a known quantity had been placed in the apparatus. The results were not satisfactory, as it was found that only 3 or 4 per cent. of the antimony was deposited on the tube in the form of a ring, when the SbH_3 was decomposed by means of heat. Better results were obtained by adding the antimony drop by drop along with the sulphuric acid, it being found that the amount of antimony recovered varied with the rate at which the sulphuric acid was added, with the duration of the experiment, and with the temperature. In consequence of the length of time required for each estimation, and the difficulty of obtaining exact results, Ciechanowski does not think that Marsh's process can be considered satisfactory for toxicological and medico-legal analyses, and he prefers the method of Bunsen, by which the antimony is obtained in the form of the oxide.

In cases of acute poisoning, antimony is found principally in the intestines and their contents, only traces being present in the liver and kidneys. The longer an animal lives, however, in cases of acute poisoning, the larger is the quantity found in these latter organs, the quantity in the kidneys being relatively larger than in the liver.

In cases of chronic poisoning, the amount found in the liver is much greater, and tends to increase the longer the animal survives. In the kidneys the same tendency to accumulate is not shown. The antimony is also found, though only in minute quantities, in the lungs, the heart, muscles, and central nervous system.

A New Process for the Destruction of Organic Matter in Toxicological Analyses.

Schlagdenhauffen and Pagel (*Ann. d'hyg.*, Paris, July 1898), in the course of an investigation into the detection of arsenic in a mixture of glycerin and organic matter, found that they could successfully combine the reactions of chromic acid on glycerin, and the transformation of arsenious acid into the chloride (Schneider's process), with the result that the organic matter was destroyed and the estimation of the arsenic accurately determined. They experimented, in the first instance, with glycerin containing arsenic, but subsequently found that the process was equally successful with any form of animal or vegetable organic matter, and when other poisons were present besides arsenic.

The method employed is as follows:—100 grms. of glycerin and 20 grms. of a mixture of two parts of sodium chloride and one part of bichromate, are introduced into a retort, and then 50 grms. of sulphuric acid added. Considerable reaction results, characterised by an increase of temperature and the production of abundant yellow fumes. The retort is then attached to a condenser and to two flasks of about 250 c.c. capacity, half-filled with water. Gentle heat is first applied by means of a sand-bath, in order to volatilise the chromyl-chloride, and afterwards it is further heated in order to disengage the sulphuric acid. Sulphurous acid is thus produced, which, by reducing the chromyl-chloride vapour, turns the liquid from yellow to green.

The solutions in the flasks are now poured into one vessel, which is heated in order to drive off the sulphurous acid, and then treated with a current of sulphuretted hydrogen. The arsenic is recovered from the yellow precipitate. The glycerin in the retort is found to be entirely destroyed by the chromyl-chloride. The authors hold that their experiments justify the conclusion that chromyl-chloride is a powerful agent for the destruction of organic matter and suitable for employment in toxicological analyses.

A Death from Chronic Strychnia Poisoning.

In the *Am. Pract. and News*, Louisville, 1st July 1898, Dr. A. H. Falconer describes a case under the above heading, which he at first took to be one of malaria, and treated accordingly. A few days afterwards he was hurriedly sent for, and found the patient (a woman æt. 35, married, with three children) lying with eyes fixed, mouth open, stiffness in the muscles of the back of the neck, and the fingers of both hands firmly clenched, so that they could not be moved. The contractions were clonic, and at times she could straighten the fingers out. The tongue was swollen, and protruded slightly. She was perfectly conscious. All the organs were carefully examined, and found to be normal, the heart only being weak.

Inquiry into her past history elicited the fact that strychnia had been prescribed for nervousness, and that during the previous eight months she had taken $\frac{1}{30}$ gr. of strychnia in tabloids, four times a day. Dr. Falconer came to the conclusion that the patient was suffering from chronic strychnia poisoning, due to over-accumulation of the drug, and he accordingly prescribed in the first instance an epidermic of pilocarpine, together with soap enemas every two hours. The patient's pulse was 110 to 120, and the temperature 98° to 99°·6. She became delirious subsequently, had involuntary micturition and evacuations, and at the end of ten days died in convulsions, which came on the day before death.

[It is unfortunate that a post-mortem examination does not appear to have been held, nor an analysis made of the urine and fæces, with a view to confirmation of the diagnosis.]

DERMATOLOGY.

UNDER THE CHARGE OF

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Untoward Consequences of the X-Rays and their Prevention.

It would seem as if there was no advantage without its corresponding drawback, and while the utility of the X-rays is now conceded, and their application includes daily wider areas, the accidents connected with their employment become better known. Oudin, Barthélemy, and Darier have in a series of articles, based on the particulars of fifty cases, directed attention to these (*France méd.*, Paris, 1898, Nos. 8–12). These include, speaking generally, œdema, cyanosis, hyperkeratosis, alopecia, etc. Some are traceable to inexperience in the use of, some to ignorance in presence of, a new power. Warned by the misfortunes of others, they have tried to avoid such by great caution, by placing the tubes at a distance of 15 to 20 cms. from the body, and by not employing an electric intensity of more than 6 to 8 ampères. Yet in 400 cases there were five troublesome accidents. These were two small sloughs on the lobe of the ear, an erysipelas-like erythema on patches of lupus, an alopecia lasting two months, and in a child of 7, who had dined an hour before, a sudden and violent fit of indigestion, followed for two months by intermittent attacks of dry colic. The harmful effects are shown by—*A*. Integumentary lesions—(1) Acute; redness, pain, swelling, vesiculation, blebs, desquamation, sometimes sloughing with cicatrices. (2) Chronic; dermatitis, thickening, loss of elasticity, of sensibility, scaling, etc. (3) Loss of hair, nails, etc. *B*. Visceral symptoms. It is curious that of two individuals, placed under similar circumstances, there is no constancy of effect. Still, unpleasant consequences seldom fail if the exposure is too prolonged, too frequent, or the approximation too near. There are also differences of individual vulnerability. They do not regard the cutaneous derangements as primitive, ascribable to a local action on the cells of the derma or epidermis, but rather to disturbances of a tropho-neurotic nature due to neuritis. This is not apparently a peripheral neuritis, connected

[illegible]

[illegible]

[illegible] in variable numbers, not only near but remote from the vessels. Some escaped red blood corpuscles are always seen. Should these be abundant, the hæmorrhagic forms are accounted for. The vesicles arise in the deep layers of the epidermis, and enlarge by degrees. Undoubtedly they exist long before they appear on the surface, a circumstance which partly explains the pruritus. As Unna has shown, they form between the cells of the mucous body. They contain white cells, of which from 33 to 95 per cent. are eosinophile. The bulla when present is chiefly an exaggeration of the same process. Having reached the surface, both lesions may be modified by superficial infection. They become filled with polynuclear leucocytes, and their contents assume a milky look. The excretion of the eosinophile cells by the skin, which seems to be an essential part of the cutaneous alterations in the disease, scarcely admits of the pustular form being regarded as primary. There is a marked tendency to hypertrophy of the epidermis, to acanthosis, accompanied by karyokinesis. The integumentary lesions are much less complex in structure than one would be led to expect from the multiform type assumed by the disease. The pustular and vegetative dermatitis of Hallopeau falls into the category embraced by dermatitis herpetiformis, and the dermic lesions do not essentially differ in the two. It is the slow progress of the vesicles towards the surface which alone explains the dissimilarities. Since the pemphigus vegetans of Neumann has not so far been encountered in France, greater diffidence must be exercised towards it, still it also approximates to Duhring's disease. As regards pathogeny, the neurotic theory has long been in favour, yet cannot be said to be proved. The pruritus, for example, may be due to toxic substances migrating into the derma, and thus acting locally on the sensitive nerves. The coexistence of major dermatoses with severe affections of the nervous system is exceptional. The alteration in the blood already mentioned rules the pathogeny. In general, the gravity of the disease is proportional to the degree of eosinophilia; with the disappearance of the latter the cutaneous symptoms subside. Certainly eosinophilia is not the sole change in the blood, though it is the chief one; it is necessary to study the alterations in the serum and the leucocytosis. The eosinophiles constantly being reproduced in the organism are eliminated by the skin, as are the toxic substances stored up in these leucocytes, or in solution in the fluid of the vesicles or bullæ. The diminution of the urinary toxicity and of the amount of urea excreted, reveal important disturbances of nutrition. But the part played by renal insufficiency is still undetermined. Be that as it may, dermatitic herpetiformis is a hæmato-dermatitis, like purpura. It may be due to toxins abnormally generated, or it may be toximicrobian. We are indeed led to suspect the existence of a microbian infection which, like syphilis, determines the exanthematic outbreaks. It is not contagious, but it is not the only microbian disease which has not yet been proved communicable.

FINSEN'S LIGHT TREATMENT.

Bang (*Monatsh. f. prakt. Dermat.*, Hamburg u. Leipzig, 1st July 1898) gives an account of the mode in which Finsen has utilised the actinic rays of the spectrum in the treatment of lupus. The source is either the solar beams or the electric arc lamp. The sun gives the most powerful effect, but, at least in northern latitudes, one must be contented for the greater part of the year with the electric light. The solar rays are collected into a focus by means of a large water lens, coloured blue by the addition to the fluid of the ammoniacal sulphate of copper, which absorbs much of the heat. In practice the patient is placed within the actual focus, so that the cone of light is larger and the heat less. The electric light requires a more complicated arrangement. The rays from an arc lamp of 50 to 80 ampères, rendered parallel by passing through two lenses of rock crystal, a substance which absorbs much less than glass of the ultra-violet rays, are employed. With these collecting agencies it is possible to kill the bacteria in a test-tube of rock crystal in the space of one minute, the action of the heat rays being excluded. Under favourable circumstances a much shorter time suffices. But when tried on lupus, no perceptible result was obtained. Blood has, corresponding to its spectroscopic properties, the power of absorbing the most refrangible rays. It was necessary, therefore, to render the part bloodless. If this was effected by compression, the rays were found to exert their bactericide influence. In practice a nurse presses on the part to be operated on with an apparatus composed of two plates of rock crystal, between which a regulated stream of cold water flows. The part is thus preserved from the heat, while the blood is driven away. If the sun's rays are used, she must at the same time alter the direction continually, in correspondence with the sun's course. About 140 cases of lupus have been thus treated, and many are apparently cured, but the experience is too short to enable the possibility of recurrences being as yet eliminated. The advantages are the painlessness of the method, and that it leaves no scars. Its drawback is the long time the treatment requires. A sitting lasts from one to two hours, a course may take from four to six months to even as much as from one to two years. While some seemingly mild cases are proportionately slow to benefit, other severe ones improve rapidly. To provide a fair test the treatment has been used alone; if combined with other methods its curative effects might be intensified. The Institute, under the charge of Professor Finsen, is erected in the grounds of the Kommune Hospital at Copenhagen, and consists of a series of buildings resembling photographic studios. In one part work of an exclusively experimental character on light biology is carried on. In another, the patients, numbering one hundred or more, are treated by a staff of five doctors and seventeen nurses.

Eczema and Ablution of the Hands.

Eczema which attacks the hands of those who are engaged in manual labour is most refractory. To the obstinacy of chronic eczema is here superadded the greater thickness of the epidermis, and its greater proliferation when inflamed. These render the cure so difficult and protracted that in general the occupation has to be given up. This is only done at a great sacrifice; and when recovery has taken place, or before it, work has to be resumed with increased diligence to make up for lost time; hence recurrences are frequent. Much damage is unintentionally done by washing the hands night and morning while at work. Unna (*Monatsh. f. prakt. Dermat.*, Hamburg u. Leipzig, 1st June 1898) observes that it is not the washing itself which must be forbidden, for an occasional cleansing has a good effect on eczema, but it is the exposure after it to the air and to other sources of harm. He therefore lays down the rule, to postpone all washing till the evening, immediately before the treatment for the night. The most rapid results are obtained by fatty applications, under an impermeable covering. The hands are first well washed with warm water and soap, the healthy parts being scrubbed with a brush, the eczematous cleansed more gently. The ointment selected is then at once applied to the hands, and these enveloped in guttapercha tissue, mackintosh, or indiarubber gloves. When the dressings are removed in the morning, the hands are merely wiped. During the day frequent inunction with some hard salve or paste is to be carried out. This may be the wax-salve pencil, or the zinc-sulphur paste. Before meals, those whose occupations are specially dirty, must rub with oil and then wipe it off. Simply giving up the ordinary morning washing in this way renders the successful treatment of most cases of eczema of the hands possible without abandoning work. The only cases in which this treatment is apt to fail are those in such as washerwomen or those whose hands are more or less constantly in contact with soap and water during the day. But even here much good can be done by applying to the hands a fat difficult to saponify, such as Unna's wax pencil or lanoline. Two rules are laid down—(1) No washing of the hands without the immediate subsequent application of an impermeable fatty dressing; (2) replacement of the customary morning washing by a thorough cleansing at night.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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Some Practical Aspects of Summer Diarrhœas.

Writing on the above subject, Bartol considers that a sharp line of demarcation can be drawn between the simple non-infective forms on the one hand and the toxic fermental types on the other; and, further, that fairly sharp divisions may be made within those lines for the purposes of description. He classes the simple diarrhœas under the following heads:—(1) Diarrhœas of nervous origin, characterised by excessive peristalsis, and caused by fright, fatigue, atmospheric conditions, and reflex irritation. (2) Those caused by the mechanical irritation of unsuitable food remaining undigested in the intestinal canal. (3) The important class which for the want of a better name, or possibly on account of imperfect investigation, must for the present be included under the general descriptive term of acute intestinal indigestion, and which are probably of duodenal origin. The leading characteristics of those varieties are that they are not associated with bacteria other than the ordinary intestinal occupants, and that they are not accompanied by any lesions of the mucous membrane.

Turning to the second or infective class, he emphasises the fact that they are always accompanied by fermental or putrefactive micro-organisms; and associated with them in all cases, lesions of the mucous membrane. We must bear in mind, however, that an intestinal disorder of the simplest non-infective variety may at any time become infected and pass quickly through the various steps, rapidly assuming serious aspects. He divides the infective class into two categories—(1) The ordinary fermental diarrhœas, without serious lesions of the mucous membrane; and (2) those attended by deeper inflammation and ulceration.

It is the first of those classes that include the immense majority of summer diarrhœas. The toxic elements are usually produced within the intestine by some of the ordinary forms of saprophytic bacteria taken in the food; but the fact should not be lost sight of, that the active poisons may be elaborated within the food before ingestion, and that no sterilisation will effect the ptomaine products thus formed—an emphatic reminder of the necessity for thorough investigation of the source and previous care of the milk, as well as of the methods of its preparation.

The diarrhœal diseases are all much commoner in hot weather, it having been shown by Seibert that a minimum temperature of 61° F., prolonged for several days, marks the beginning of summer epidemics; but it is especially the fermental forms that come into prominence at this time, and it is to this type that we owe the enormous increase in the rate of mortality.

Since the mildest case of diarrhœa may at any moment assume the character of the most severe infective variety, it is of the greatest importance to institute active measures for arresting symptoms due to toxic elements as soon as ever they occur. Those symptoms of poisoning are produced by the action of the bacteria on the nervous system, and are manifested objectively by one or more of the following conditions:—(1) High temperature; (2) marked restlessness; incessant movements and sleeplessness; (3) notable prostration and cardiac collapse; (4) reflex vomiting.

The measures of treatment recommended are as follows:—(1) A purge consisting of calomel or castor-oil; (2) abstinence from milk in any form, from twenty-four to thirty-six hours; (3) full stimulation; (4) thorough and persistent irrigation of the bowel with high injections and unirritating solutions; (5) in cases of pyrexia, cold water in the form of baths or packs, combined with mustard for surface stimulation; (6) in choleriform cases, injections of saline preparations into the subcutaneous tissues; (7) the exhibition of bismuth in large quantities, with salol or some other antiseptic, is of undoubted value. When milk must be stopped for a day or two, a substitute for the fluid thus cut off should be given in the form of barley- or rice-water or wine-whey, always in small quantities, and administered either hot or cold. Persistent vomiting is often checked by stomach washing.—*Boston Med. and S. Journ.*, 21st July 1898.

Congenital Rickets in conjunction with Tetany.

At the Budapest Medical Society, Berend exhibited an infant the subject of congenital rickets. The child, who was 7 days old, was very poorly developed, and weighed only 5 lb. The head was markedly rachitic, especially in the occipital region, which was almost completely membranous, whilst all the sutures and fontanelles were widely open and gaping. There was thickening of the epiphyses of the long bones, beading of the costal cartilages, with softened ribs and prominent sternum. The skull was unequally developed, the child early exhibited clonic spasms of both sides, and there was exophthalmos of both eyeballs, the pupils being dilated and immovable—symptoms pointing to some defective cerebral development. The interesting point in the history was that the mother had for fourteen years been the subject of well-marked tetany. The tetany developed after the birth of the first child, which was alive and healthy. Since then she has had six children, and all of them had succumbed in infancy, several from clonic spasms, two from spasm of the glottis, and one, it was said, from fright.

There seems to be a strong probability that in this case the congenital rickets of the child was influenced by the condition of the mother.—*Centralbl. f. Kinderh.*, Leipzig, 1897, Bd. ii. S. 220.

BRONCHO-PNEUMONIA.

IN a long and interesting article on this subject, Dr. West arrives at the following conclusions:—(1) That the disease in its early stages is closely related to capillary bronchitis, from which it can hardly be distinguished clinically; (2) that as a rule it is a secondary affection, and met with under the following conditions—(*a*) as a consequence of bronchitis; (*b*) as a sequel of infectious diseases, such as measles, whooping-cough, and diphtheria; (*c*) as the result of the inspiration of infective particles and foreign substances.

Clinically three classes of cases are distinguished—(1) That which corresponds with capillary bronchitis, is of gradual onset, in which there is little consolidation, but signs of very acute congestion. The temperature is hectic in character, the course prolonged and interrupted by frequent relapses, and the termination is by lysis. (2) The disseminated form in which the history and symptoms are similar, but the disease is of sudden rather than of gradual onset. (3) The type in which there is no antecedent affection of the air tubes, and in which the illness is of sudden onset and short duration. The temperature is persistently high and the termination is by crisis, the clinical symptoms resembling those of croupous pneumonia, while the pathological lesions are those of broncho-pneumonia. The consolidation in these cases is widely disseminated, but even when a considerable part of the lung is involved, there are, between the patches of consolidation, areas of collapsed or even emphysematous lung tissue.

Whilst the first two groups stand in close relation, both clinically and pathologically, with bronchitis and other affections of the air passages, the last division, described as a primary broncho-pneumonia, much more closely resembles croupous pneumonia. These differences are explained by bacteriological examination.

Speaking generally, broncho-pneumonia is shown to be associated with several varieties of pathogenic organisms; for example, the streptococcus, the staphylococcus, tubercle bacilli, and others; but chief among them all is the pneumococcus, which is present either alone or in association with others in at least 50 per cent. As far as evidence goes, it seems to show that in secondary broncho-pneumonia the streptococcus is the most frequent organism, whilst in the primary types the pneumococcus prevails, being almost as common in them as it is in the lobar pneumonias of adults.

The conclusions to which this evidence points are obviously these—(1) That primary and secondary broncho-pneumonias have a different bacteriological origin; (2) that secondary broncho-pneumonia is for the most part due to streptococcus infection, derived from the air tubes, mouth, or throat; (3) that primary broncho-pneumonia is of pneumococcus origin; (4) that pneumococcus pneumonia occurs with equal frequency in the child and adult; (5) that pneumococcal inflammation takes a different form, according to the age of the subject, producing in the adult massive consolidation, and in the child disseminated patches. —*Brit. Med. Journ.*, London, 28th May 1898.

ICTERUS NEONATORUM.

VERMEL's investigations on this subject have led him to believe that the jaundice is due to pathological causes, supervening during the first moments of extra-uterine life, and not to physiological conditions attending the birth of the child. It occurs in children born at full time, only when the labour has been a difficult one, in malpresentations in the children of primiparæ, or when the child is born in a condition of asphyxia.

On examining the liver in fatal cases, venous stases and retention of bile in the bile ducts was always present. The retention of bile is favoured by anything which tends to prevent the full expansion of the lungs, or interferes with the free action of the heart, both of which conditions so frequently follow after a difficult labour. The jaundice develops most frequently about the third day, never appearing as early as the first, and rarely delayed as late as the fifth day. The duration of the illness is from six to fourteen days, and occurs, according to the author's investigations, 395 times out of 1000 newly-born children. The icteric tint is first observed on the nose and cheeks, and occasionally the face alone is jaundiced, the rest of the body remaining of a normal colour. The colour of the urine is unchanged in mild cases, but in more severe attacks bile pigment is present. There is often profound alteration of nutrition and slowing of the pulse rate during an attack. —*Presse méd. belge*, Bruxelles, 1 Juin 1898.

LARYNGOSCOPY IN CHILDREN.

EXAMINATION of the larynx in infants and young children presents peculiar difficulties, and the ordinary method of laryngoscopy fails as a rule to give any satisfactory result. General resistance on the part of the child, and refusal to open the mouth, an inability to protrude the tongue, failure to comprehend the examiner's request to phonate, holding the breath, retching, and often a considerable accumulation of mucus in the pharynx, are some of the difficulties which are met with when an attempt is made to obtain a view of the larynx in such patients. A method which combines depression of the tongue along with traction upon it has been found a useful and valuable one in many hands: in this way arching of the dorsum of the tongue is prevented, and at the same time the epiglottis is drawn forwards, so that the superior aperture of the larynx is rendered more patent. More than one method of applying this principle has been adopted. Petersen of Berlin, in a paper translated by Guild of Dundee (*Journ. Laryng.*, London, June

1898, briefly reviews this subject. He found that, in his own hands, a light tongue depressor, that introduced by Mount Bleyer, proved very useful, the curved extremity of the spatula permitting a grip upon the base of the tongue. His examination is conducted as follows:—The child is placed on the lap of an assistant, the arms, legs, and head are fixed, the latter being inclined slightly backwards; the mouth is opened by means of the spatula, which is gently passed backwards along the tongue to its base, and is pressed into the hollow in front of the epiglottis; so that the tongue is drawn forwards and slightly upwards by the pressure of the instrument upon it. The laryngeal mirror is then quickly introduced into the back of the throat, and at the next inspiration, in most cases, a satisfactory view of the larynx is obtained, even when the patients struggle violently. If, at the first attempt, the spatula or the mirror is not in the right position, or the view is obscured by mucus, the instruments are withdrawn, and the operation is repeated a second or third time if required. The amount of traction upon the tongue necessary to draw forward the epiglottis varies in different cases, but the author has never seen injury or hæmorrhage result from this procedure. It may be mentioned that Rauchfuss found Fränkel's tongue depressor of service for drawing forward the tongue and epiglottis in such an examination.

Sutherland and Lambert Lack (*Lancet*, London, 11th Sept. 1897), in a paper upon Congenital Laryngeal Obstruction, describe their success in obtaining a view of the larynx in six cases suffering from this condition. The same principle was carried out, but in a somewhat different manner. The infant was held in the usual position for laryngoscopy, and then the index-finger of the left hand was passed into the mouth over the base of the tongue, and the terminal phalanx was hooked round the hyoid bone, which is in this way well pressed forwards; the rest of the finger held down the tongue out of the way, and with the left thumb pressed up under the chin the child's head was steadied. A small laryngeal mirror was next introduced in the usual way, and the larynx was brought into view. The question of an anæsthetic for the purpose of examination is one which may require consideration in some cases, but the advisability of giving chloroform for such a purpose does not find favour with some persons. A claim has been put forward in favour of Kirstein's autoscopy, or direct examination of the larynx without the aid of a mirror, for infants and children. Kirstein himself asserts that in very young children it may be used in preference to laryngoscopy; they may be examined with or without an anæsthetic. In either case the head is drawn over the edge of the table, and is held by an assistant. The autoscope is then taken in the left hand, the spatula being directed downwards so that the base of the tongue is pressed forwards; the child's head is then gradually raised or lowered until the angle is reached at which the interior of the larynx comes into view.

ANALYTICAL REPORTS.

PREPARATIONS: (BAYER; ELBERFELD FARBENFABRIKEN CO. LTD.).

Tannigen (Acetyl of Tannin).

This appears to be a product formed by the combination of tannic acid with albumin. It is insoluble in water, and is said to pass through the stomach unaltered, but to be gradually decomposed in the bowel, the tannic acid being set free. From some experiments formerly made upon tannic acid in digestion, we should say that it is not unlikely that the albumin moiety is partly at least acted on in the stomach, but that the tannic acid set free at once combines with other native proteids or proteid derivatives. In the bowel, however, tannates will be found giving off tannic acid by interaction with the intestinal organic acids. As tannic acid combined with proteid is not astringent, its action necessarily will not become positive until the bowel is reached. As tannic acid given in a purer form is liable to act on the gastric epithelium and on pepsin, tannigen is very much more useful; in the bowel it is only given off very gradually, and so produces its wished-for effect without detriment.

It may be given in doses of from 2 to 5 grs. or more, and is a valuable adjuvant to the treatment of enteritis, acute and chronic diarrhœa.

Europhen.

Europhen is soluble in ether, chloroform, and oil, insoluble in water, and forms a light yellow powder with a slight smell, but on contact with water gives off an odour of iodine, of which it contains 27 per cent. It is therefore very similar to iodoform in its properties, but devoid of any strong smell, and is used for similar conditions, but especially for venereal complaints.

Lycetol.

Is suggested as a solvent for uric acid; a property which it is credited with to a very considerable degree. Related to piperazine,—in fact it is a compound of an organic acid, tartaric acid, and dimethyl-piperazine, with a not unpleasant taste, and a stable constitution,—it possesses credentials which may well let us hope that in the future it will prove the panacea so long sought for in the treatment of uric acid anomalies. The dose recommended varies from 16 to 32 grs. per diem for at least three weeks.

Lycetol is also prepared in the form of an effervescing granulated powder by Bishop & Sons, London, and it is believed to act more quickly when administered in this form. Each bottle of the effervescing powder is provided with a wooden measure holding the correct dose, about 2 drms. Each drachm represents 5 grs. of lycetol.

TRIONAL.

THIS product hardly requires further notice at our hands. It is well known to be a rapid, pleasant, and active hypnotic, while it is especially noted for the frequent success following its use for producing sleep in cases where actual pain is present. Half an hour suffices for its action to take effect, in contradistinction to the length of time required before chloralamide, sulphonal, and other similar hypnotics begin to act. The dose should be 24 grs. at first, 16 grs. each night later on. Bayer has found that 8 to 16 grs. arrests the night-sweats of phthisis.

IODOTHYRINE.

ONE part of iodothyrine (formerly thyroiodine) is equivalent to one part of the fresh gland, the strength being regulated by the addition of sugar of milk. The actual substance, unmixed with sugar of milk, was found by Baumann to contain 9·3 per cent. of iodine. The preparation under notice contains 0·3 per cent. of iodine, and is not liable to decompose. The advantages gained by the use of iodothyrine arise from the absolutely exact dosage which it is possible to secure, owing to its stable properties and constant strength. The proper dose varies in different cases—5 to 48 grs. a day in myxœdema; 5 to 80 grs. in obesity; 5 to 15 or 30 grs. to children for rickets. It should be commenced in 5-gr. doses, and gradually increased. Iodothyrine forms an excellent example of the almost perfect class of products prepared by the Elberfeld firm of Bayer & Co.

LIQUOR COLCHICINÆ SALICYLATIS (HOPKINSON).

(Baiss Brothers & Co., London.)

WE can scarcely do more than repeat our favourable opinion of this preparation, expressed in these columns some months ago. Another sample of it has been forwarded to us. At the recent meeting of the British Medical Association the makers afforded members an opportunity of examining their different preparations, in their stand at the annual exhibition. All visitors must have been impressed by the uniform neatness, purity, and generally attractive appearance of the exhibits. Further trial of the liquor colchicinæ salicylatis confirms our former judgment as to its usefulness in obstinate gouty and rheumatic conditions, and proves that it frequently produces good results where other remedies have failed.

Mistura Bismuthi Aromatica and Mistura Bismuthi Aromatica cum Pepsina.

(Baiss Brothers & Co., London.)

Practical experience of the good results following the administration of the aromatic mixture of bismuth (Baiss), allows us to corroborate what was said before in this place about its merits as a preparation capable of acting in a very beneficial manner upon some forms of dyspepsia. The addition of the tincture of nux vomica to a mixture containing bismuth, morphine, and hydrocyanic acid, is one of those happy instances where partial pharmacological antagonists, given in combination, produce much better effects than either body given singly. The second preparation is identical in composition, save for the addition of pepsine. In both, $\frac{1}{32}$ gr. of morphine is present in each drachm, the dose recommended. The mixtures are elegant examples of a skilful pharmaceutical art.

OBITUARY.

Frank Shearer, M.D.

The early death of Frank Shearer has removed a widely-known and much-esteemed member of the medical profession in the West of Scotland. Born just forty-four years ago in one of the manses of Larkhall, he was sent in due course to the University of Glasgow, where he and the present writer sat side by side under Ramsay and Lushington. Having resolved to become a doctor, he followed the curriculum of his university, and took his degrees with the greatest distinction in 1876. After filling the post of house-physician in the Western Infirmary, Glasgow, he widened his experience by work in the Carlisle Infirmary and the Somerset County Asylum. He afterwards settled down in Paisley, where he soon acquired one of the largest practices in the West, and became physician to the Infirmary. He was a man of loyal and lovable nature, and his premature death has left a great blank in a wide circle of friends.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Four Weeks ending August 27, and for the Year from January 2.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 2.	Actual.	Accumulated from Jan. 2.	
		Above 42°.	Below 42°.					
Mean	56°·8	*[1] 426° [2]1655°	0° 649°	3·0	19·4	128	989	2°·5
Observed	57°·4	[1] 459° [2]1764°	0° 427°	2·2	15·6	144	1022	2°·5
Difference	−0°·6	[1] +23° [2] +109°	+ 0° −222°	−0·8	−3·8	+16	+33	0

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland, during August, and since January 1. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Nervous System.		Respiratory System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 944 [2] 8769	167·0 193·8	195 1744	34·5 38·5	83 829	14·7 18·3	118 1006	20·9 22·2	119 1712	21·07 37·8
Actual Deaths and Rate per 10,000	[1] 1057 [2] 8794	187·0 194·3	202 1869	35·7 41·2	110 872	19·5 19·2	109 1016	19·2 22·4	137 1521	24·2 33·6
Difference from Mean	[1] +113 [2] + 25	+20·0 + 0·5	+ 7 +125	+1·2 +2·7	+27 +43	+4·8 0·9	− 9 +10	−1·7 +0·2	+18 -191	+3·13 −4·2

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 87 [2] 558	15·4 12·3	26 227	4·7 5·0	49 636	8·7 14·1	96 883	16·9 19·5	45 375	8·09 8·28
Actual Deaths and Rate per 10,000	[1] 101 [2] 659	17·8 14·5	32 214	5·6 4·72	70 697	12·4 15·4	81 868	14·3 19·2	54 435	9·5 9·5
Difference from Mean	[1] +14 [2] +101	+2·4 +2·2	+ 6 −13	+0·9 −0·28	+21 +61	+3·7 +1·3	−15 −15	−2·6 −0·3	+ 9 +60	+1·41 +1·3

* NOTE.—The figure [1] denotes the data for August, [2] for year to date.

The mean temperature during the four weeks ending August 27 in the East of Scotland district was rather above the average, the excess of accumulated day degrees above 42° reaching 28 in number. The rainfall for the four weeks was deficient by nearly an inch, or 26 per cent. below the mean; but it should be noted that in the rainfall for the [illegible] had [illegible] the usual August figure. Direct sunshine was about 13 per cent. [illegible] range, the daily variation of temperature [illegible]. The [illegible] ted figures for the year show an excess [illegible] day degrees [illegible] per cent. above, and [illegible] 8·5 per cent. below [illegible] rainfall of 2·3 inches, or 19·5 per cent. [illegible] sunshine.

The number of total deaths during August was [illegible] 12 per cent. [illegible] the mean for the month, chiefly caused by increase [illegible] deaths from circulatory, respiratory, and digestive diseases. [illegible] the fatal cases from pneumonia [illegible] under the [illegible] respiratory system. Influenza caused three deaths in Edinburgh.

The figures for the year show a [illegible] increase [illegible] considerable excess over the mean in the number of deaths from circulatory and digestive diseases, from pneumonia and [illegible] these the more prominent are the digestive diseases, with [illegible] per cent. over the [illegible] expected, and [illegible] with [illegible] per cent. [illegible] the average figure. Deaths from respiratory diseases show [illegible] marked decrease, equal to 11 per cent. of those [illegible].

This August, characterised by [illegible] during the fortnight from the 14th to the 28th, and [illegible] shows an increased death-rate under [illegible] nervous diseases and phthisis. The [illegible] data [illegible] normal—shows an excess in the number of deaths [illegible] all the different causes except from respiratory and [illegible] diseases and from phthisis.

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ORIGINAL COMMUNICATIONS.

THE PHYSIOLOGICAL ACTION AND THERAPEUTIC PROPERTIES OF PODOPHYLLIN, WITH SPECIAL REFERENCE TO INDIAN PODOPHYLLIN.

By Hector W. G. Mackenzie, M.A., M.D. (Cantab), F.R.C.P. (London), *Assistant Physician, St. Thomas's Hospital;* and Walter E. Dixon, B.Sc., M.B. (London), D.P.H. (Cantab), *Salters' Company Research Fellow, St. Thomas's Hospital, London.*

At Professor Dunstan's suggestion, we have investigated the physiological and therapeutic effects of Indian podophyllin and its constituents, in connection with the chemical examination of this plant which he has undertaken at the request of the Government of India.

The genus *Podophyllum* comprises two species, the American variety, *P. peltatum*—alone recognised by the British Pharmacopœia at the present time—and the Himalayan, *P. emodi.*

P. peltatum, or May-apple, grows in the Northern and Middle United States. *P. emodi* grows abundantly in Northern India, inhabiting the shady valleys in the inner ranges of the Himalayas, being particularly prevalent in Cashmere and Runawin, and is a plant which can be cultivated with ease. It is said to be one of the bile-expelling plants of Sanskrit writers, and has been mentioned in the Indian pharmacopœia as a possible source of podophyllin.

Although it is now some thirty-five years since *P. peltatum* was introduced, the first communication of importance on the subject of its chemical constitution and physiological action was made by Podwyssotzki[1] as recently as 1881. He, starting with podophyllin-resin from *P. peltatum* — prepared by precipitating the resin from the alcoholic extract of the rhizome by means of the addition of water—isolated—

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[1] "Pharmakologische Studien ueber *Podophyllum peltatum*," *Pharm. Journ. and Trans.*, London, vol. iii. pp. 12, 217, 1011; *Arch. f. exper. Path. u. Pharmakol.*, Leipzig, Bd. xiii. S. 40.

1. A colourless amorphous substance, sparingly soluble in water, but readily in spirit, and very active, 1 to 5 mgrms. killing a cat (podophyllo-toxin). He obtained from this substance as well as from the resin two further bodies—(*a*) A crystalline, very bitter substance, insoluble in water, and found by him to be physiologically inactive (picropodophyllin); (*b*) a substance readily soluble in hot water, which he called podophyllinic acid.

He further considered that podophyllo-toxin was a combination of picropodophyllin with podophyllinic acid.

2. Podophyllo-quercitin.

3. Green oil and a crystalline fatty acid, both of which are inert.

Kursten[1] amplified this work, and showed that picropodophyllin and podophyllo-toxin were isomeric.

Umney,[2] working with *P. emodi*, prepared from the resin substances similar to those prepared by Podwyssotzki from *P. peltatum*. He stated that the amount of resin obtained from the rhizome of *P. emodi* is about twice as great as from *P. peltatum*, and that this resin yields about 25 per cent. more amorphous podophyllo-toxin, but only half the quantity of picropodophyllin; and he further concludes that the resin from *P. peltatum* is more active than that from *P. emodi*, and that picropodophyllin is the active principle.[3] Dunstan and Henry,[4] in a paper on Indian and American podophyllin, have shown that the constituents of the two resins are identical.

They prepared a crystalline podophyllo-toxin, $C_{15}H_{14}O_6.2H_2O$, which, on treatment with aqueous alkalis, becomes converted, first into a gelatinous acid, podophyllic acid, and subsequently into picropodophyllin, the isomeride of podophyllo-toxin. Quercitin, and a non-crystallisable resin, podophyllo-resin, were also prepared by the same authors.

The investigations of Dunstan and Henry have shown that podophyllin-resin consists of—

1. Podophyllo-toxin.

2. Quercitin (identical with ordinary quercitin from quercitron bark).

3. A residual resin; by dissolving this in alcohol and fractionally precipitating with water, two resins were obtained—(*a*) Podophyllo-resin (an active purgative); (*b*) a non-purgative resin.

4. Fatty matter.

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[1] *Arch. d. Pharm.*, 1891, S. 229, 220-248.

[2] *Pharm. Journ. and Trans.*, London, vol. iii. pp. 23, 207.

[3] Umney states that picropodophyllin is not active unless rendered soluble, which end is attained in the rhizome by its combination with podophyllic acid, which combination Podwyssotzki calls podophyllo-toxin.

[4] *Trans. Chem. Soc. London*, 1898, p. 209.

The following table shows the proportions of resin in rhizome and of podophyllo-toxin and quercitin in resin, according to Dunstan and Henry, and Umney:—

	P. emodi.	*P. peltatum.*
Percentage of resin from powdered rhizome . (Dunstan & Henry)	9 – 12 per cent.	4 – 5 per cent.
Do. do. . (Umney)	11 – 4 ,,	5 – 9 ,,
Percentage of podophyllo-toxin and quercitin in resin (Dunstan & Henry)	2 – 5 ,,	Less 1 ,,
Do. do. . (Umney)	1·3 ,,	2·4 ,,

We have examined a very large number of different preparations of Indian and American podophyllin and their derivatives, but only the more important results have been embodied below.[1] The substances employed were supplied by Professor Dunstan. They were labelled according to a code, of which the key was only furnished when our observations were completed; and were prescribed without any knowledge as to whether one preparation would prove more active than another. It was thought that in this way the results would be more reliable than if we started with any preconceived ideas as to what we were to expect.

The examination was conducted — first, physiologically, on animals, the more important results being subsequently verified on a healthy man; and, second, therapeutically, in the treatment of patients suffering from chronic constipation.

We desire to express our thanks to Dr. Brodie, Lecturer on Physiology at St. Thomas's Hospital, for much valuable advice on the physiological side of the subject.

RESIN. — Samples of the two resins from *P. emodi* and *P. peltatum* respectively, were first subjected to comparison, with the result that, weight for weight, the resin from *P. emodi* was found to be a decidedly more active substance than the American variety.

One gr. of the resin of *P. peltatum* is physiologically somewhat less active than ½ gr. of *P. emodi* resin. The physiological effects of the two resins are the same, except that the Indian resin is more irritant to the stomach, vomiting being produced more frequently in animals than is the case with the American resin. It will be noted that the important difference in the physiological activity of the two resins observed by us disproves Umney's statement, that the peltatum-resin is the more active. Umney does not record the number and nature of the observations on which his statement is founded, and as it was thought that he might have had an accidentally inactive sample, some experiments were made with his original emodi resin,[1] and verified our previous results: 1 gr. of this resin produced such effect on one of us as for a time to cause motions every half-hour, attended with severe griping, although 1 gr. of the peltatum-resin produced only a moderate result.

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[1] To Mr. Morris, then assistant pharmaceutist at St. Thomas's Hospital, we are indebted for many pharmaceutical preparations.

When used therapeutically, the resins were dissolved in aromatic spirits of ammonia and were combined with small doses of belladonna and nux vomica, in order to prevent griping and to assist the action. The remedy was chosen in cases of chronic constipation, and in all cases was tried over a considerable period. The following comparative table will show the action:—

SINGLE DOSE AT NIGHT.	*P. peltatum.*		*P. emodi.*	
	Satisfactory.	Not Satisfactory.	Satisfactory.	Not Satisfactory.
$\frac{1}{2}$–1 gr.	0	4	3	4
$\frac{1}{5}$–$\frac{1}{3}$,, ...	3	2	4	4[2]
$\frac{1}{12}$,, (child) . . .	2[3]	...	1	...
DOSE GIVEN THREE TIMES A DAY.				
$\frac{1}{3}$–$\frac{2}{3}$ gr.	...	...	2	4
$\frac{1}{12}$–$\frac{1}{6}$,, ...	2	1	2	3
$\frac{1}{15}$–$\frac{1}{20}$,, ...	1[4]	1	...	...
$\frac{1}{30}$,, (child) . .	...	...	1	...

It will be seen that, while neither form of resin can be depended on to relieve the bowels in cases of chronic constipation, the emodi-resin was on the whole the more satisfactory. While in none of the three cases in which $\frac{1}{2}$- to 1-gr. doses of peltatum-resin were given did the remedy act, it acted in three out of seven cases in which similar doses of emodi-resin were given.

With the smaller doses, whether given once or three times a day, the result with the two resins was very similar. In only one of the cases, and that a case where the peltatum-resin was given, was there any complaint of griping.

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[1] Kindly provided us by Mr. E. M. Holmes.

[2] In one of these cases the bowels acted well at first, but not later.

[3] In one of these cases the bowels acted too much in a few days.

[4] In this case the bowels became too loose.

PODOPHYLLO-TOXIN (*Crystalline*).—This substance, administered in small doses, is an active purgative, whilst if the dose is increased the purging is preceded by vomiting. The administration of large doses in dogs gives rise in from a half to one and a quarter hours to vomiting. This is rarely very severe or prolonged, and is followed, generally after the passage of a normal motion, by diarrhœa. Should the dose have been sufficiently large, acute enteritis is set up, and usually terminates in collapse and death. The motions become more and more frequent, and soon begin to contain a little blood, and, before the stage of collapse is reached, consist of little more than glairy mucus and blood. Intra-peritoneal injection of the alcoholic solution produced effects similar to those following administration by the mouth, in from two to three hours, vomiting occurring as before when the dose reached a certain amount. No pain or inconvenience of any kind to the animal accompanies this form of administration.

When given by subcutaneous injections, the drug exerts its specific effect (diarrhœa, etc.) equally well; but some inconvenience is felt at the seat of injection, which occasionally is followed by necrosis of the skin and ulceration.

It is interesting to note that the external irritant effects of podophyllin, in the form of skin eruptions and conjunctivitis, have been sometimes observed in those engaged in powdering the resin.

Spindler[1] states that podophyllo-toxin of Podwyssotzki acts as a powerful reducing agent on the blood, and that under its influence oxyhæmoglobin is converted into methæmoglobin. We have endeavoured both to recognise this substance in the blood of animals after a lethal dose of podophyllo-toxin, and also to prepare it artificially outside the body from fresh blood and podophyllo-toxin, but in each case without success.

In a few cases, after the administration of large doses, certain muscular effects were observed: the animal became generally rigid, but especially in the hind-limbs. Its movements were characterised by stiffness and ataxia, as a result of the latter, the legs being held widely apart. This stage was followed by one of convulsions, the movements being especially noticeable in the head, which showed constant twitchings; the pupils, generally dilated, acted badly to light; reflexes poorly marked and sensation blunted, and in one case spasm of the glottis resulted. This general condition, which seems purely muscular, comes on when the gastro-intestinal symptoms have abated, and only after the administration of large doses. It occurs in but a few cases, probably because a dose sufficient to produce this effect is also generally sufficient to produce an acute enteritis, necessitating the death of the animal by artificial means.

The *post-mortem examination* of animals killed with chloroform, some hours after the introduction of a lethal dose of podophyllo-toxin, shows a normal *stomach*, except in a few cases, when an exceptionally large dose produced patchy congestion. The *small intestine* shows signs of acute inflammation, beginning a few inches below the pyloric end of the stomach, and extending a variable distance downwards. The mucous membrane is intensely red and swollen, and some shedding of the epithelium and occasionally small ulcers the size of a threepenny-piece have been observed. Peyer's patches are swollen and well marked. This inflammation never extends beyond the ileo-cæcal valve, and in the majority of cases it is confined to the upper 10 or 12 in. of the small intestine.

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[1] Thèse de Yourieff, 1893.

There is a general congestion of all abdominal organs. Peritoneum normal. *Kidneys* show intense hyperæmia. The cortex is swollen, and of a greyish red compared with the vivid red of the medulla. The epithelium of the tubules is in a condition of cloudy swelling, and there is some shedding of cells.

Occasional hæmorrhages into the glomeruli and tubes, and a general distension of the capillaries, are also present. *Liver* congested. *Gall bladder* empty, probably as a result of contraction of the abdominal muscles in defæcation.

In one case hæmorrhages into the bladder wall were produced, together with signs of cystitis.

Redness of the trachea resulted in two cases.

Precisely similar appearances in every respect are observed when the drug is administered by injection.

An investigation of the action of two commercial samples of Podwyssotzki's amorphous podophyllo-toxin, prepared by German firms, showed that it gave rise to effects identical with those of the crystalline form.

The therapeutic effect of the drug can be seen at a glance in the following table. The patients in each case were suffering from chronic constipation.

Dose of Podophyllo-toxin.	Satisfactory.	Non-satisfactory.
(Dunstan) $\frac{3}{8}$–$\frac{1}{2}$ gr. (single dose at night) .	2	1
(Podowyssotzki) $\frac{2}{5}$–$\frac{2}{3}$ gr. ,, ,, .	2	1
(Dunstan) $\frac{1}{20}$–$\frac{1}{2}$,[1] t.d.s.	3	3
(Podowyssotzki) $\frac{2}{5}$, t.d.s.	...	1

Both the crystalline and the amorphous podophyllo-toxin acted on the whole with more certainty than podophyllin itself. The necessary dose of podophyllo-toxin, however, appears to be almost as large as that of the resin, and, as in the case of the resin, doses not exceeding ½ gr. act better than larger doses. In three cases doses of 1 gr. were given: one patient reported she always vomited ten minutes after taking the medicine; in the other two it had little or no purgative action, and upset digestion in one of these.

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[1] This patient took the $\frac{1}{2}$-gr. dose three times a day by mistake, she being ordered the dose only once a day. She found, however, that although the action of the bowels was much improved, she was affected by vomiting in the morning, and had to diminish the dose.

One patient was given 1½ grs. of this crystalline podophyllotoxin; this large dose acted satisfactorily on the bowels, but gave rise to pain, although there was no vomiting.

TYPICAL EXPERIMENTS ILLUSTRATING THE EFFECTS OF PODOPHYLLO-TOXIN.—

EXPERIMENT 1.—Cat, full-grown male; weight, 2·197 kilos. Given ⅕ gr. crystalline podophyllo-toxin by mouth, 10 A.M.

11 A.M.—Vomited twice.

12 A.M.—Lying down and refusing food.

1 P.M.—Passed solid fæces, and directly afterwards a fluid evacuation, light yellow in colour.

3 P.M.—Another diarrhœa stool. Very thirsty.

Next day animal quite normal.

EXPERIMENT 2.—Injection, ⅖ gr. podophyllo-toxin into body cavity of full-grown male cat, weight, 2·15 kilos., at 12 A.M.

2 P.M.—Cat very uneasy, vomited twice.

2.30 P.M.—Semifluid evacuation of bowels passed.

3 P.M.—Purging incessant, motions quite fluid, and stained at first with bile.

4 P.M.—Evacuations consist now of little more than a very fluid, blood-stained mucus. Respirations laborious. Heart, 180, irregular and feeble.

4.30 P.M.—Animal killed with chloroform.

Post-mortem.—Small intestine shows marked inflammation, beginning 2½ in. from pyloric end of stomach, and extending to within 12 in. of ileo-cæcal valve. The inflammation is patchy near the pylorus, but continuous lower down the gut. The mucous membrane is swollen, intensely red, and covered with a gelatinous blood-stained mucus. Stomach normal, gall-bladder empty. Congestion of the abdominal organs, especially kidneys. Peritoneum normal.

EXPERIMENT 3.—Cat, of weight 1·712 kilos. Administered ⅕ gr. podophyllo-toxin, 10.45 A.M. (mouth).

12.40 P.M.—Vomited three times.

3 P.M.—Diarrhœa marked.

4 P.M.—Seems disinclined to move. Very difficult to rouse, and will remain in any position in which it is placed. All the muscles are twitching irregularly, in a very marked manner, the twitchings being well brought out by a tap. Sensation blurred, and pinching the tail elicits little response. Extreme rigidity, especially in hind-quarters. Reflexes present, and appear unaltered. Pupils dilated, and hardly react to light. Heart, 210; respiration, 44.

This general condition had passed off next morning, and the animal appeared well, eating and drinking normally.

EXPERIMENT 4.—Terrier; weight, 4·023 kilos. Injected subcutaneously with $\frac{2}{5}$ gr. alcoholic solution of podophyllo-toxin, 10 A.M.

10.45 A.M.—Vomiting.

11.15 A.M.—Diarrhœa well marked, and later, traces of blood can be seen.

No subsequent ulceration at seat of injection. Animal normal next day.

EXPERIMENT 5.—Healthy man; weight, 11 st.; subcutaneously injected in the left arm with $\frac{2}{5}$ gr. podophyllo-toxin (alcoholic solution), 12 A.M. Next morning the whole arm was swollen red, and œdematous, and necrosis of tissue had occurred round the seat of injection, resulting in the formation of an ulcer, effectually forbidding further experiments in this direction.

PICROPODOPHYLLIN.—This substance is isomeric with podophyllo-toxin, but it should be clearly understood that it is not contained in the plant.

The physiological effect on cats and dogs was *nil* in doses up to $\frac{1}{2}$ gr., although in one case $\frac{1}{5}$ gr. was sufficient to produce a slight purgative effect in a medium-sized cat.[1] A sample of Umney's picropodophyllin likewise failed to produce any result in doses up to $\frac{1}{3}$ gr.

Subcutaneous and intra-peritoneal injections produced negative results, except for some irritation at the seat of subcutaneous injection. The irritant action of this substance was also shown accidentally in a cat, which inhaled some of the drug and subsequently died from pneumonia.

Purgative results may occur after very big doses. Physiologically, then, this substance is irritant, but has little useful activity unless given in very large doses.

Therapeutically, picropodophyllin was given at night in three cases of chronic constipation, in from $\frac{2}{5}$- to $\frac{1}{2}$-gr. doses, in alcoholic solution, and was said to act satisfactorily in two. The discrepancy here may possibly be the result of the fact that, when the drug was used therapeutically, it was given in solution, and not as a pill. It is certain, however, that the physiological action does not always coincide with the therapeutic, and just as a smaller dose of podophyllin resin may be effective therapeutically when a larger fails, so a comparatively inactive substance physiologically, such as picropodophyllin, may produce an effect in the diseased condition when a more active substance would fail.

PODOPHYLLIC ACID.—This substance is the hydrate of picropodophyllin, as is shown from the facts—

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[1] A repetition of twice the dose, however, failed to produce any effect on the same animal, and the condition was considered an accidental complication.

1. Picropodophyllin, when boiled with alkali, gives podophyllic acid.

2. Podophyllic acid loses water and becomes picropodophyllin.

This substance is therefore likewise an artificially-produced product, and does not occur as such in the plant.

Sodium podophyllate is a comparatively inactive substance, behaving very like picropodophyllin. In doses up to $\frac{1}{4}$-gr. no purgative effects were produced in animals.

In man, sodium podophyllate was tried in six cases, in doses varying from $\frac{3}{10}$ to $\frac{4}{5}$ gr. daily. It produced good action of the bowels in three out of the six cases. In one of the cases where it failed, both the peltatum and emodi resins likewise failed to purge. In one case $\frac{4}{5}$ gr. gave rise to pain in the stomach, and made the patient feel deadly sick, although she did not vomit, but caused no action of the bowels.

In another case of very obstinate constipation, $\frac{4}{25}$ gr. were given three times a day, with the result that, although the bowels remained much constipated, the motions were said to be much larger in amount.

Podophyllo-quercitin.—This has been shown by Dunstan to be identical with ordinary quercitin, from quercitron bark. We are satisfied that in doses up to $1\frac{1}{2}$ grs. this substance is quite inert, neither tending towards constipation nor purgation. Umney considers that the peltatum has nearly twice the amount of this substance yielded by the emodi, but this is not proved, as his method was not sufficiently accurate.

Podophyllo-resin.—The resinous material remaining after the complete extraction of podophyllo-toxin, was examined by us and found to be as active physiologically as the crude emodi-resin; that is to say, twice as active as the ordinary B.P. resin. The quercitin was also extracted, and the residual resin dissolved by alcohol, and separated into two parts by fractional precipitation of such a solution with water. One fraction consisted of a brownish red resin, active as a purgative (podophyllo-resin), the other of a black powder, almost insoluble in alcohol, and tending to produce constipation in grain doses. This podophyllo-resin in many respects resembles podophyllo-toxin; it is about equally toxic, and produces the same irritant, intestinal, and renal effects; also, like podophyllo-toxin, it is readily soluble in alcohol, and may be injected subcutaneously or into the peritoneal cavity, where it produces identical results.

There is, however, one marked exception to this similarity in action—that is, with reference to its cholagogue action. In a series of experiments on anæsthetised dogs, a horizontal tube being placed in the bile duct, and the cystic duct being clamped, there was some increase in biliary secretion when this resin was injected, but negative results, or even a diminution, with podophyllo-toxin. In the case of a man with a biliary fistula, but who was otherwise quite well, taking moderate exercise and living upon a fixed diet, a marked increase in the solids followed the administration of podophyllo-resin, but a diminution both of the quantity and of the total solids was obtained after podophyllo-toxin had been given in equal doses.

If we compare these two active constituents of the crude resin, we find that ·006 grm. of either will give rise to diarrhœa in a medium-sized cat, and ·05 grm. of either would be a lethal dose, the sequence of events being in either case vomiting, diarrhœa, convulsions.

Physiologically, therefore, podophyllo-resin is quite as toxic as podophyllo-toxin; it is not, however, such a good purgative; in man, slightly larger doses of the former being required to produce an equivalent effect on the bowels.

Therapeutically, a number of resinoid substances were tried. Indian podophyllin freed from podophyllo-toxin was given in nine cases:—

Dose.	Satisfactory Result.	Slight Result.	No Action.
1½ gr.	1	2	1
1 gr.	1	1	1
½ gr. (children) . .	...	...	2

Two of the patients complained of headache whilst taking the medicine, but there were no other unfavourable symptoms. It will be seen from the above that larger doses of the "resinoid" are required than of the resin, and that the action is more uncertain.

For purposes of comparison, an artificial resin was made by adding to this "resinoid" substance 30 per cent. of crystalline podophyllo-toxin, with results in every way agreeing with those produced by the Indian resin.

Indian podophyllin, freed from both podophyllo-toxin and quercitin, was next tried. This was used in nineteen cases. In doses of 1 gr. it was given in fifteen cases; and in nine of these it produced satisfactory evacuations, slight actions resulted in two, and in four it had no effect. In one case the remedy only acted well after it had been continued for some time; whilst in another case, in which it failed in 1-gr. doses, it also failed in 2-gr. doses, and in this case grain doses of ordinary podophyllin had also no effect. Half-a-grain doses to a child produced rather too frequent action of the bowels, whereas in another child suffering from headache, dulness and depression of spirits, with sluggish action of the bowels, doses of $\frac{1}{12}$ gr. three times a day greatly improved the patient's spirits and general health, and acted well at the same time on the bowels.

Podophyllo-resin itself was given to healthy men in a number of cases, with the result that ½-gr. doses generally produced a satisfactory action on the bowels, or the same effect followed when the drug was administered three times a day in doses of ⅕ gr.

TYPICAL EXPERIMENTS ILLUSTRATING THE PHYSIOLOGICAL ACTION OF PODOPHYLLO-RESIN.—

EXPERIMENT 6.—Dog, bull-terrier; weight, 3·925 kilos.; injected subcutaneously ½ gr. podophyllo-resin in alcoholic solution. In twenty-five minutes the dog became restless; in thirty to thirty-five minutes after the injection a normal stool was passed, followed almost directly by a diarrhœic stool.

During the next two hours about eight fluid motions were passed. The animal was normal next day.

EXPERIMENT 7.[1]—Healthy man, weight about 8½ st., feeding on a regular and fixed diet, with the same amount of food, water, and exercise daily; had been fitted with a tube and bottle by which the whole of the bile could be collected and examined daily.

The following figures were obtained in this fashion:—

	Quantity.	Specific Gravity.	Solids (total).
[2] January 20 . .	670	1012	15·197
[3] ,, 21 . .	710	1013	18·857, ⅖ podophyllo-resin
[4] ,, 22 . .	779	1012	18·571, ⅗ ,,
[5] ,, 23 . .	817	1010	
,, 24 . .	774	1008	15·348
,, 25 . .	758	1008	14·311, ⅗ gr. podophyllo-toxin
,, 26 . .	700	1008½	13·944

These figures are sufficiently significant, and show clearly the marked increase of the solid produced by the administration of the resin, the quantity of bile not being materially altered; it is noteworthy that no effect on the bowels was produced in this experiment by the podophyllo-resin, although the podophyllo-toxin produced looseness.

EXPERIMENT 8.—Two dogs (about equal weight) were anæsthetised with ether. The abdomen was opened and a horizontal tube placed in the bile duct, the cystic duct being meanwhile clamped in each case.

[1] For the publication of this experiment we are indebted to Dr. Bain, *Brit. Med. Journ.*, London, 1898, vol. i. p. 1647.

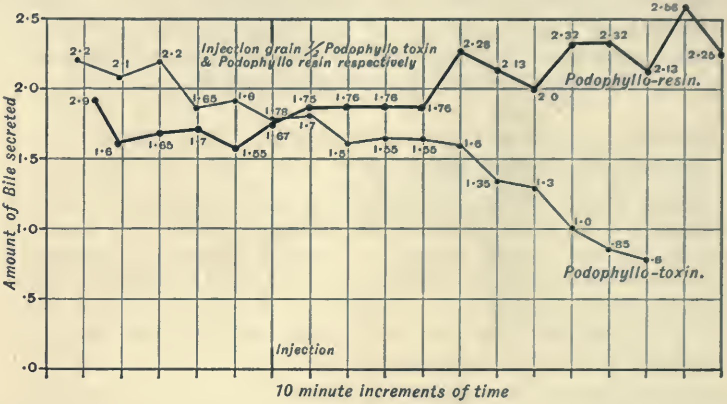
[2] The sp. gr. had not been higher than this except after administration of certain drugs with a cholagogue action.

[3] Effect of the exhibition of ⅕ gr. of podophyllo-resin, administered twice at a slight interval.

[4] Result after administration of ⅕ gr. podophyllo-resin, at 8, 12, and 4 respectively.

[5] Result after administration of ⅕ gr. podophyllo-toxin, at 8, 12, and 4 (acted twice on the bowels).

The appended curves show the results produced where the abscissa represents time, and the ordinate the amount secreted. It will be noticed that the quantity gradually increases in the one case, after the injection of podophyllo-resin, whilst in the second experiment, where the podophyllo-toxin was injected, the secretion rapidly diminished.



In conclusion, we wish to draw attention to the following points:—

That Indian podophyllin is an active purgative and a useful therapeutic agent; that it may be substituted for *P. peltatum*; but it is important that the physician should know which sample he is prescribing, as the Indian variety is nearly twice as physiologically effective as the American.

That the active principles contained in the crude resin are two substances—(*a*) Crystalline podophyllo-toxin; (*b*) podophyllo-resin,—both of which act as excellent laxatives in small doses, without secondary constipation or other objectionable symptoms.

That although both these substances act very similarly on the alimentary tract, it is only the podophyllo-resin which exerts a true cholagogue effect, which shows itself rather by a large increase of the solids secreted than by an increased quantity.[1]

Both exert their specific activity when injected hypodermically in alcoholic solution, but in man so much irritation is produced as to forbid their employment in this manner.

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[1] The cholagogue effect of this substance (*i.e.* increase of bile salts) has been estimated as greater than that of any other known substance.—*Brit. Med. Journ.*, London, 1898, vol. i. p. 1647.

PARALYSIS OF THE SIXTH AND SEVENTH CRANIAL NERVES.

By G. A. Gibson, M.D., D.Sc., *Senior Assistant Physician, Royal Infirmary, Edinburgh.*[1]

(Plate V.)

In order to illustrate the application of the facts of anatomy, physiology, and pathology to clinical medicine, there could be no better instance than the case now before you. It is that of a laundress, æt. 49, admitted to Ward 27 on account of chronic bronchitis. Her father is said to have died about the age of 60, from an ulcer of the stomach, which may possibly have been a malignant affection; her mother, at the age of 59, of dropsy. She believes she has one brother alive. Two brothers are dead, one having died of fever in South Africa, and the other from some form of paralysis due to brain disease. Her social surroundings have not been by any means satisfactory; she has had no fixed home for a long time, but has lived lately in the Salvation Army Shelter. Previous to the bronchial affection for which she sought advice, she has had no serious illness—so far as we know—for a long period. When about twelve months old she was playing one day on the floor, and her mother suddenly noticed a change in her appearance. From that time there has been loss of power over the right side of her face, without any affection of that side of the body, the face alone being involved. She has since then, but still long ago, had several illnesses, including measles, bronchitis, and smallpox. There has been, moreover, rheumatic pains in her knees, and in her side, as well as several other minor aliments, which do not require any particular note.

Confining ourselves to-day to the nervous system, let me briefly state that there is absolutely no change in the sensibility of any part, tested in every way. With regard to the motor functions, there is complete paralysis of the muscles of the right side of the face; that is to say, every branch of the facial nerve, so far as we can make out, is deprived of its functions. Many of the symptoms produced in consequence of this affection may be seen at a glance; certain of them, however, require careful search.

The right side of the forehead is much more youthful than the left, being marked by no lines of thought, whereas on the left side there are very distinct furrows; near the middle line they are visible on the left, but not on the right side. The right eye is more widely open than the left, by reason of drooping of the lower eyelid, over which the tears trickle, in consequence of the failure of the lid, with its duct, to rest on the globe. The nose is slightly, and the mouth considerably, deflected towards the left side; the upper lip, further, on the right side hangs over its corresponding lower fellow. These are facts which the most superficial observer could not fail to take note of, and they are present when the face is entirely in repose, as may be seen in PLATE V.

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[1] Part of a Clinical Lecture delivered in the Royal Infirmary.

If such symptoms are obvious while the face is at rest, they become almost dramatic in their intensity when the muscles of expression are brought into action. When the patient attempts to shut her eyes the left can be firmly closed, but the right remains open, and the sole result is that, in popular phraseology, she "turns up the white" of this eye. On asking her to show her teeth, the left half of the upper lip alone is elevated. She has never acquired the art of whistling, but is a willing novice; when she is requested to make the attempt, she merely puffs out her right cheek, and the air escapes through the weakened lips on that side. As she has never learned the accomplishment—if it may so be called—of moving her ears, it is impossible by simple inspection to say whether she has lost control of that of the right side. On looking into the mouth with the view of examining the muscles of the palate, it cannot be decided whether there is any difference between the two lateral arches of the veil, and, so far as can be discovered, the uvula hangs vertically. Since the sense of taste is of the greatest importance in the localisation of facial lesions, it is necessary to investigate it with the greatest care, and in doing this the tests employed must be sapid, yet odourless, so that, while the gustatory nerves are stimulated, the olfactory are not excited. On applying salt, quinine, and other inodorous substances to the anterior part of the right side of the tongue, our patient immediate gives a correct response, in so far as she is familiar with the taste of the substance, to a question as regards its nature. Since the patient has enjoyed no opportunity of being trained in æsthetic matters, and is, moreover, by no means of an observant character, it is not in our power to ascertain if she appreciates musical sounds better with one ear than the other, but there is no doubt of the fact that she can hear ordinary sounds more distinctly with the left ear. As the point is one of real importance, the patient has been kindly examined by Dr. M'Bride, who reports that, while a watch, normally audible at 30″, is heard by the right and left ears at 5″ and 15″ respectively, the tuning-fork is heard at 12″ and 8″. This shows that the stapedius is almost certainly affected.

To sum up succinctly the groups of muscles which are affected will render the determination of the site of the lesion—the anatomical diagnosis—easier. All the muscles of expression, in short the whole of the muscles of the face, are paralysed, including the orbicularis palpebrarum and the orbicularis oris, both of which will merit particular attention. We must not lay stress upon the condition of the palatal muscles, but there is greater intensity of hearing musical notes on the right side, and by the use of electricity it is easy to ascertain that the retrahens aurem and the anterior part of the digastric muscle are paralysed. The sense of taste is intact.

But over and above all these paralytic phenomena, there is [illegible] other side. The patient cannot, indeed, wink with the eye on the affected side, because there is no power of determining unilateral impulses from the side of the brain in which the supra-nuclear lesion is situated, yet both eyes can be closed simultaneously by the influence of the other side. There is another great distinction besides this, dependent upon the state of the muscles. In a case of paralysis, caused by a lesion above the nucleus, there is no interference with the nutrition of the muscles, by which is meant, not that there may not in the long run be a change in these, but that there is no immediate trophic change; whereas, in the case of paralysis affecting the nuclear or infra-nuclear region, there is rapid wasting. Closely associated with this consideration is the important difference as regards electrical reactions. In supra-nuclear lesions there is no reaction of degeneration; in paralysis from lesions in or below the nucleus this phenomenon is present.

Passing down to the trunk of the nerve, if there be any lesion above the geniculate ganglion, there is paralysis of the whole of the muscles of the face, including the orbicularis palpebrarum, the orbicularis oris, and the frontalis and digastric muscles, as well as those of the ear, along with the increased intensity of sounds, correctly explained by Lucae[1] as due to paralysis of the stapedius muscle, but there is no implication of the sense of taste.

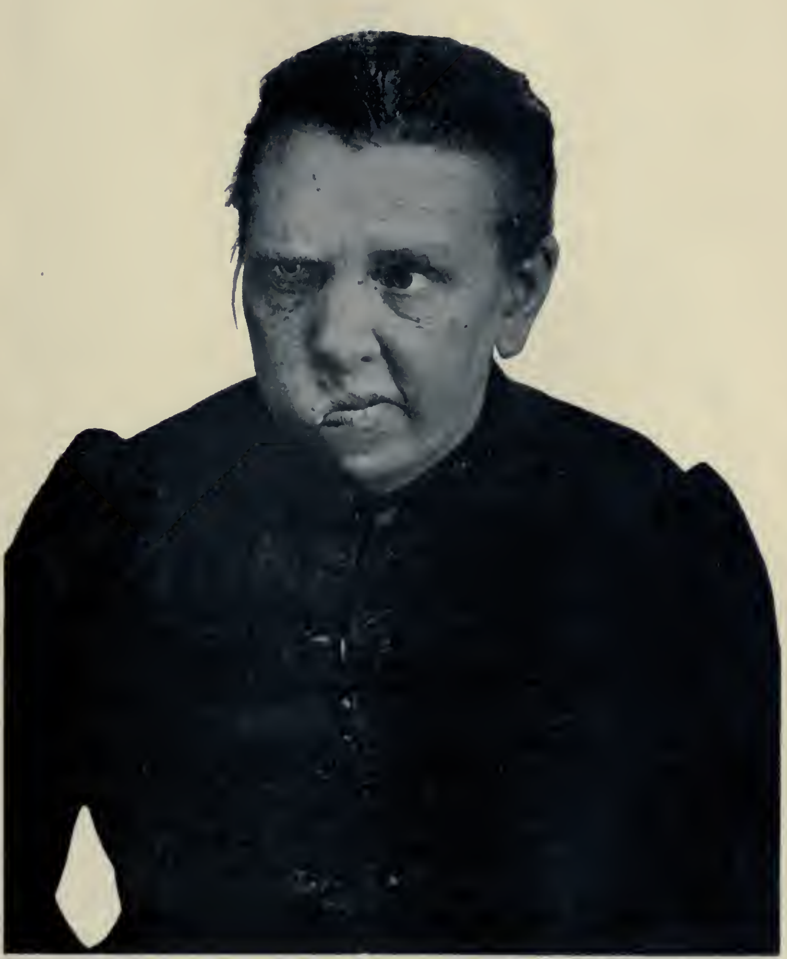
In the case of a lesion of the nerve at the geniculate ganglion, it was at one time a great tradition of the Edinburgh school that there was paralysis of the soft palate, because, on the authority of Sanders,[2] who popularised the view to all English readers, it was believed that the palatal muscles were rendered useless. It used to be taught that the innervation of the elevating fibres of the palate was from the seventh, derived through the great superficial petrosal, and only in recent years has the view that the palate is supplied in this way been altogether refuted. The palate receives its supply by the vago-glosso-pharyngeal nerves from the nucleus ambiguus, as has been proved by Turner and Bulloch.[3] We must therefore regard paralysis of the palate as having nothing at all to do with any affection of the facial nerve.

Proceeding downwards, the next point is that, if there be an affection anywhere below the geniculate ganglion, there is a loss of the sense of taste over the anterior two-thirds of the tongue.

Now it is my duty to bring before you very briefly some recent observations bearing upon the relations of these nerves to each other. The orthodox view is that the chorda tympani, apart from its secretory functions, is a sensory nerve. It accompanies the lingual nerve for a certain distance, and then pursues an individual course, till it reaches the Fallopian aqueduct, where it becomes related to the facial nerve. You have probably, in your

[1] *Berl. klin. Wchnschr.*, 1874, S. 163.
[2] *Edin. Med. Journ.*, 1865, vol. xi. p. 141.
[3] *Brain*, London, 1894, vol. xvii. p. 706.

PLATE V.



anatomical studies, seen it in the aqueduct as it passes up, and you have no doubt been taught physiologically to believe that it leaves the facial nerve again at the geniculate ganglion, follows a course forward, so as to pass into the second division of the fifth, along which it goes to its centre. If that be true, the nerve is without question one of the most complicated in the body. There are a great many facts which support this view, but some throw a certain amount of doubt on it. It is not part of our duty to shirk difficulties, but rather to try to solve them, and some of these must be brought before you.

Points in favour of this hypothesis are, that there is a large number of cases now in which disease solely of the fifth nerve has caused a loss of the sense of taste in the anterior two-thirds of the tongue. Gowers[1] describes an interesting example of such cases, and they can only be explained on the present hypothesis; the case narrated by Ferguson[2] of exostosis, pressing upon the Vidian nerve and producing absolute loss of taste over the anterior two-thirds of the tongue, is strongly in its favour; some cases described by Fedor Krause[3] are, nevertheless, antagonistic to this view, if there is no loophole of escape. In some cases in which, on account of trigeminal neuralgia, the fifth nerve has been entirely removed, it has been found that the sense of taste has persisted. If this be so, it is extremely difficult to explain from these phenomena, as contrasted with the more usual results, how the disease of the fifth nerve abolishes the sense of taste in the anterior two-thirds of the tongue. Further, against this view are the embryological researches of Dixon, who has found that the chorda tympani takes its origin without a doubt as a branch of the facial nerve. It therefore is embryologically to be looked upon, according to Dixon,[4] as an appanage of the facial nerve; he further urges that the geniculate ganglion is truly a ganglion. If it be so it must have some sensory nerve, and, if the chorda tympani be not a sensory nerve belonging to the system, the ganglion diverges from the usual plan. These are the great facts against the current view. Certain writers have tried to find a way out of the difficulty, by suggesting that in different individuals the taste fibres take different courses. This may be true, for there are minor diversities in the distribution of nerves, just as there are in the distribution of vessels; that there should be individual variations of such colossal proportions, as that the sense of taste should sometimes pass upwards by the seventh, and sometimes by the fifth, is nevertheless so incredible that we must put it out of court altogether. We must at present follow in the footsteps hallowed by the teachers of the past, although regarding the view of Dixon with much interest, and hoping that in the future the question may be definitely settled.

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[1] *Edin. Med. Journ.*, 1897, N.S., vol. i. p. 37.
[2] *Med. News*, Phila., 1890, vol. lvii. p. 395.
[3] "Die Neuralgie des Trigeminus," Leipzig, 1896, S. 89.
[4] *Edin. Med. Journ.*, 1897, N.S., vol. i. p. 395.

Another vexed question must also come before you. The orbicularis oris is commonly believed to receive its nerve supply from the hypoglossal nucleus, or that of the twelfth nerve, as is stated by Gowers,[1] for example, but it is certain that the fibres run in the course of the seventh, wherever they arise. This view is far from being universally held, and from the results of microscopic investigation it is combated by Dr. Alex. Bruce, who in a communication recently made at the Pathological Club, but not yet published, gives good reasons for holding our judgment in suspense. This patient has complete paralysis of the orbicularis oris, which forms one of the difficulties which we shall have to face in reaching the localisation of the lesion.

In addition to the various symptoms of facial paralysis, you remember that she also suffers from loss of power of the external rectus of the eye on the same side. This means that there is a lesion, either of the nucleus, or of the trunk of the sixth—the abducent nerve. In this connection let me bring before you diagrammatically the relations of the different oculomotor nerves. In the first place, let us look at the third nerve nucleus, which is split up into several subdivisions. At the superior end there is the nucleus which appears to innervate the muscles of accommodation, followed by that which supplies the circular muscle of the iris; to those succeed, in the order following, those which pass to the internal rectus, the superior rectus, the inferior rectus, and the inferior oblique. It is very interesting to note that those muscles which work together have their nuclei close together; for instance, the inferior rectus and inferior oblique are commonly in co-operation, and very frequently also the internal rectus and the superior rectus. Passing a little further down, but still in the region of the Sylvian aqueduct, is the nucleus of the fourth.

In front of the acoustic tuberculum lies the nucleus of the sixth nerve. It is situated immediately below the motor root of the fifth, and at the same level as, but a little superficial to, the sensory nucleus of that nerve. The nucleus of the seventh, which lies somewhat lower down and at a deeper level than that of the sixth, with the long sensory root of the fifth intervening, has its fibres curving first upwards and backwards towards the floor of the fourth ventricle, then forwards and downwards, so as practically to embrace the sixth nucleus. These points will help us in the anatomical arguments. They are shown in Fig. I., which is based upon one given by Brissaud.[2]

Having now brought before you every fact bearing on the condition of the patient, it is necessary to sum up the various

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[1] "Diseases of the Nervous System," London, 1888, vol. ii. p. 276.

[2] "Leçons sur les maladies nerveuses," Paris, 1895, p. 371.

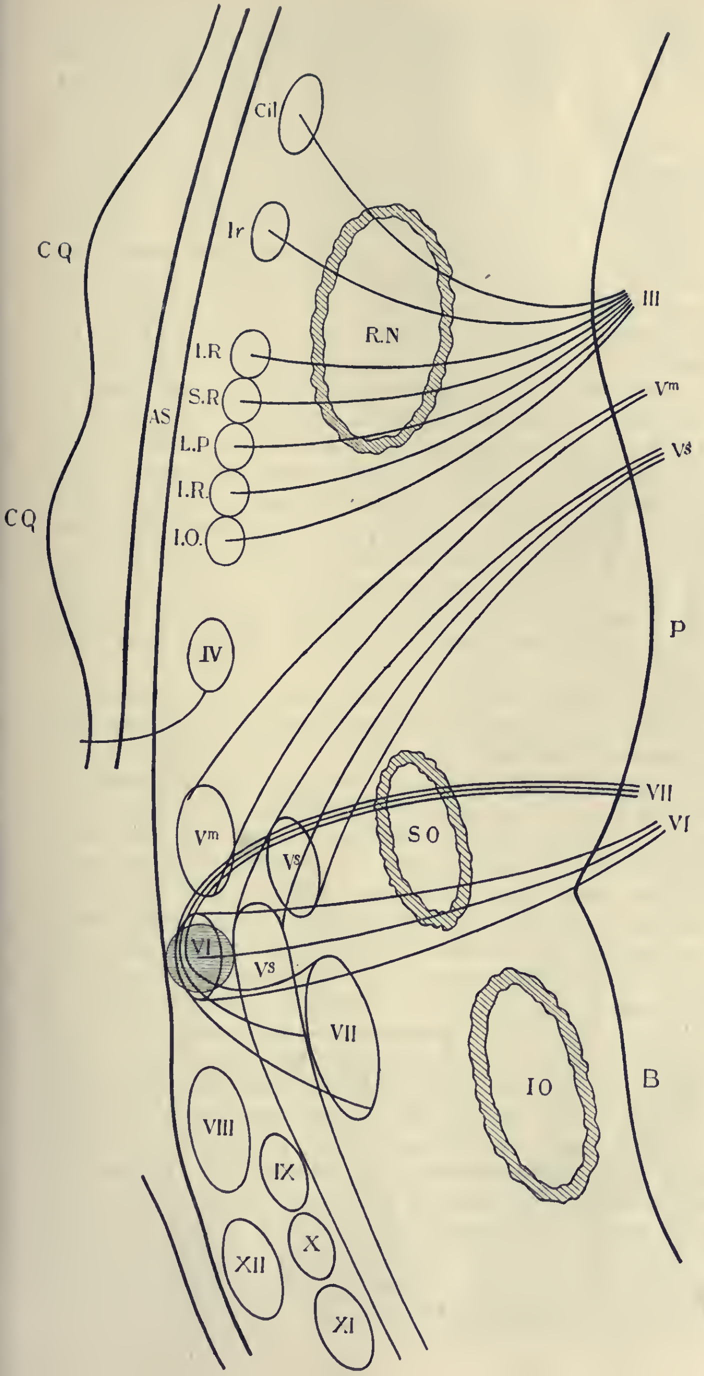

FIG. 1.—Diagram of the positions of the nuclei of the oculo-motor nerves and their connections. CQ, corpora quadrigemina; P, pons; B, bulb; RN, red nucleus; SO, superior olive; IO, inferior olive; Cil, special division of third nucleus for the ciliary muscle; Ir, for the constrictor pupillæ; IR, for internal rectus; SR, for superior rectus; LP, for levator palpebræ; IR, for inferior rectus; IO, for inferior oblique; IV, nucleus of fourth; V^m, motor, and V^sV^s, sensory nuclei of fifth; VI., VII., VIII., IX., X., XI., and XII., nuclei of remaining bulbar nerves. The dark shaded circle marks the site of a possible lesion.

points which can help us to a definite conclusion. From the different symptoms present, it must be clear to you that the facial lesion must be either nuclear or infra-nuclear, on account of the state of the orbicularis palpebrarum. If the current view regarding the supply of the orbicularis oris is correct, the lesion cannot be nuclear; it must be lower down, after the hypoglossal twig has joined it. It must, notwithstanding, be situated above the origin of the nerve to the stapedius muscle. Then, as the sense of taste is unaltered, the lesion must be above the geniculate ganglion. But the paralysis of the sixth nerve must also be reckoned with. Acting upon the principle of Newton, we invariably attempt to find one cause which will account for all the phenomena of any case. There are two positions in which one lesion might cause the double paralysis of the sixth and seventh nerves. There may have been an affection of the nucleus of the former, affecting the fibres of the latter as they pass round it, as shown in Fig. I. Such a lesion, although far from common, is nevertheless well known. It resembles an acute anterior polio-myelitis of the cord lower down. On the other hand, there may have been a lesion affecting the trunks of both nerves as they pass along the base of the brain. Although by no means very close to each other, they are not so remote but that one morbid process might affect both. There are no facts to determine which is the more likely affection. With regard to the anatomical diagnosis, nothing further remains to be said.

As to the pathological diagnosis, let me briefly refer to the fact that there are a great many different causes of facial paralysis. In supra-nuclear cases there are all the vascular lesions of the brain. Hæmorrhage, embolism, thrombosis—any one of these three may cause that form of paralysis. A tumour growing within the brain, affecting it in that region, may cause facial paralysis of the lower part of the face; and an abscess, even taking its origin in the middle ear, may cause similar changes, leading to that form which has been called supra-nuclear. The nucleus may be involved in anterior polio-myelitis; the trunk may be interfered with by any lesion of the base of the brain; in consequence of bone disease, the facial trunk below the nucleus may suffer, or the endings of the nerve going to their peripheral distribution may be affected. In the case before us the lesion must have been an affection of the nucleus of the sixth, of an acute nature, affecting the facial fibres passing round it, or some meningitic lesion of the base of the brain.

In regard to the future of such cases as this, in which the facial nerve may be assumed to be destroyed, the prognosis is absolutely hopeless. In cases of peripheral facial paralysis the prognosis is usually quite good. After a few days or weeks, the patient is entirely restored to health. If the paralysis does not pass off in a few weeks, it is not usually peripheral; it is probably due to some lesion within the bone.

With respect to treatment, no methods will be of any avail in such a case as this, except to avert some of the consequences following upon the paralysis, particularly the proneness to inflammation of the eye.

ON THE INNERVATION OF INTRACRANIAL VESSELS.

By Alexander Morison, M.D., F.R.C.P.Ed., *Physician, Out-patient Department, Great Northern Central Hospital, and Children's Hospital, Paddington Green, London.*

It has long been known that nerve fibres follow the course of vessels both in the dura mater and in the pia mater. Kölliker[1] refers to the researches of Arnold, Purkinje, Pappenheim, Rüdinger, and Bochdalek in this respect. He also states[2] that he has himself followed such nerves in the pia mater to arteries of 9 μ diameter and less, into the substance of the brain, but that these have never been traced to their termination, and that it is certain that in the vascular plexus no nerves are to be found.

Writers on the circulation in the brain may be divided into those who assume that the cerebral vessels are innervated, and those who likewise assume the contrary. A painstaking examination of the matter by Lovell Gulland[3] resulted in his stating that neither by the silver mercury nor methylene blue methods could he succeed in demonstrating any nerve fibres in the walls of the pial vessels nor of the intra-cerebral vessels. Dr. Gulland, however, succeeded, I understand, in July of this year, by Cox's method, in staining nerves in the vessels of the pia mater. Obersteiner described the appearance of nerves on the pial vessels in a gold preparation in 1897.[4] In connection with a course of lectures on the relation of the nervous system to disease and disorder in the viscera, it became my duty to investigate the matter; and the result of my examination of the innervation of the pia mater and of the vessels coursing through it I now propose shortly to set forth. I also wish to state that my research would in all probability not have been undertaken had not Sir John Batty Tuke impressed upon me the fruitless search of others, for I was under the impression that the facts mentioned by Kölliker had settled the point, that is, I did not question the innervation of these vessels. On the 5th of May in this year I obtained the fœtus from a cat well advanced in pregnancy. The cat was killed by chloroform and drowning. The brains of the fœtus (or fœtuses, if this plural be permissible) were divided into moderately small pieces, and treated by Sihler's hæmatoxylin method, which I recently related,[1] and some portions were further stained by being placed in the hæmatoxylin solution for twenty-four hours after their first immersion. Towards the end of May I succeeded in staining the nerves coursing with the vessels of the pia mater, twisting in some instances round them, and terminating in a plexiform manner on them, the mode of termination being most visible on the larger vessels. The further particulars I shall mention in this place will have reference (1) to the character of the structures from which the nerves in question arise; (2) to the size of the vessels in association with which the nerves have been found; (3) to the character of the nerve fibres; (4) to a description of the mode of termination of the nerves in the vessels and in the pia mater; and (5) to the presence of ganglion cells in the stems of the innervating trunks, and to the character of these cells.

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[1] "Gewebelehre," sixth edition, p. 835.

[2] *Loc. cit.*

[3] *Journ. Physiol.*, Cambridge and London, 1895, p. 361.

[4] *Neurol. Centralbl.*, Leipzig, 1897, Bd. xvi. S. 356.

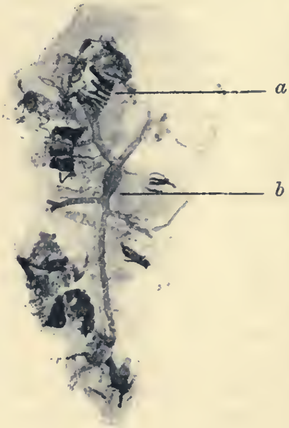

FIG. 1.—*a*, basal-shaped nerve bundles; *b*, vascular circle.

1. *The character of the structures from which the nerves arise.*—In one of my preparations (Fig. 1) a series of bundles of nerve fibres is to be seen, which, taken in the aggregate, present somewhat the appearance of a tassel. The individual bundles or strands of the tassel measure on an average 7 μ in diameter. The bundles consist of many smaller bundles of about 1 μ and less, and these of still finer fibres. They lie on each side of an artery which divides into a stout circle, and then proceed as a single tube. The vessel before dividing measures 18 μ across, each side of the circle 10 μ, and the vessel beyond the circle 15 μ. I was inclined on first sight to think that the vessel was from the base of the brain, and that the tassel-like bodies were the commencement of cranial nerves. But on examination the latter were found to be centripetal to the vessel, and the circle was much too stout for, and otherwise differed from any possible representative of the circle of Willis. I have not yet, by injected preparations, been able to determine the precise origin of these tassel-shaped bundles. The latter have no general sheath, but the individual bundles definitely cohere.

2. *The size of vessels in association with nerves.*—The largest of these in my possession measures 20 μ across, and the smallest about 10 μ. The nerves naturally bear a relation in size to the vessels. Those in the largest vessels measure 2 μ across, and in the smallest are mere threads.

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[1] *Edin. Med. Journ.*, January 1898.

3. *The character of the nerve fibres.*—The dimensions of the trunks is as stated above. The individual bundles of the nerves measure about ·5 μ across, and are interrupted at intervals by a nuclear body. These nuclear bodies are more numerous in the finer fibres, and are an adumbration of the nuclear dispersing

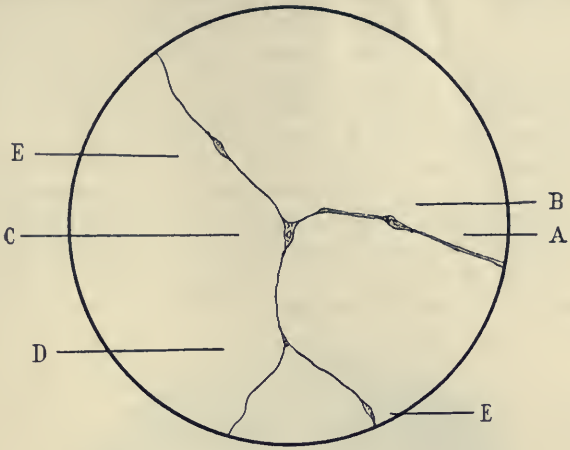

FIG. 2.—A, nerve about to form plexus; B, preplexal nucleus; C, triradial nuclear organ of plexus; D, subsidiary nuclear point of distension; E E, nuclear bodies on fibres of plexus.

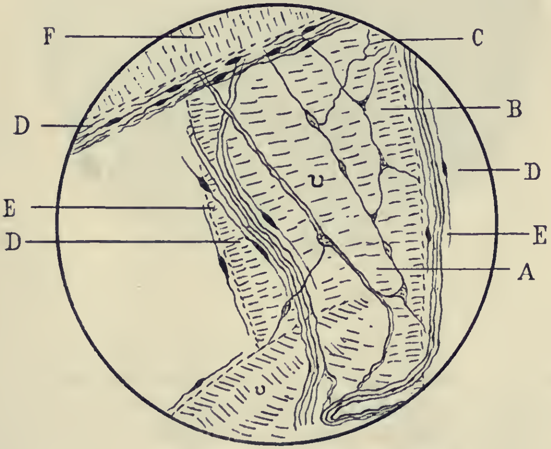

FIG. 3.—A, source of plexus; B, triradial nuclei in plexus; C, finer ramification; D D D, nuclei and fibres of vascular and neural sheaths; E E, large nerves; *v*, pial vessel; F, crossing vessel.

and connecting points of the penultimate and ultimate plexuses. The nerves have a sheath which shows connective tissue corpuscles in the larger branches, and a hyaline sheath which exists in the smaller is lost when the fibre becomes single at a point of departure from the parent trunk. The nerves which innervate the pia mater are similar in character to those which follow, twist round, and end upon the vessels, and may occasionally be actually seen to take their departure from the nerve on the vessel. In other cases no vessel is at hand to settle this point.

4. *The mode of termination of the nerves.*—The nerves terminate both in the pia mater and on the vessels by a plexus, which in its ultimate distribution is so fine as to give the appearance of an excessively fine dichotomous ramification (Figs. 2 and 3). The nuclear points of dispersion vary in size, according as they are penultimate or ultimate, from bodies 1·5 to 2 μ across to fine points which cannot be accurately measured, but which are certainly not more than ·5 μ, while the finest ramifications end by a series of small refracting points. These are presumably what some term nerve endings, but whether they are portions of a very fine and endless plexus I cannot positively affirm. The plexus in the vessels is best seen, for sufficient reasons, on the larger branches.

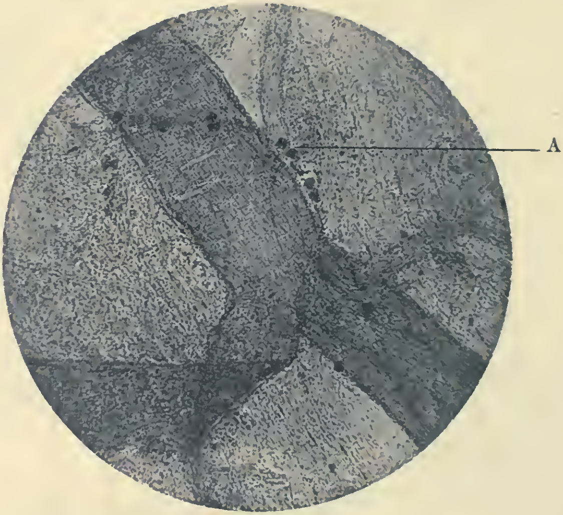

FIG. 4.—A, ganglion cells as vessel of pia mater.

5. *Ganglion cells.*—Nerve trunks, both at what I have termed the tassel-shaped sources, and some passing through the pia mater apparently on their way to vessels, as well those on the vessels, in some instances show ganglion cells (Fig. 4). These are all *unipolar*, measure from 2·5 to 1 μ across, and have a well-marked nucleus

and nucleolus. A specimen (Fig. 4) showing ganglion cells on a nerve trunk, which twists as a diagonal spiral round the artery, entwines the latter like a garland of roses. The well-defined and completely developed character of these cells, with their well-defined axone, preclude the possibility, in my opinion, of their being embryonic and transient structures.

Although, therefore, I have not detected an innervation of the small arteries of the vascular plexus, I believe it is legitimate to conclude that further research will still more extend the anatomical distribution of the cerebral vascular nerves, and think we already have sufficient evidence of such innervation to modify current conceptions of the physiology of the intracranial viscus. The further discussion of this important point I must leave till a later date.

ON THE MICROSCOPIC CHARACTERS OF RETAINED PRODUCTS OF CONCEPTION.

By T. W. Eden, M.D., M.R.C.P, *Senior Assistant Physician, Chelsea Hospital for Women.*

It is sometimes necessary to recognise or exclude pregnancy by microscopic examination of—(1) Matters expelled from the uterus, or removed with the finger or curette; (2) blood clot found in the peritoneal cavity, or in a dilated Fallopian tube or broad ligament. Inasmuch as products of conception found under such circumstances differ notably from the same tissues obtained under normal conditions, mistakes frequently arise, which sometimes lead to needless mutilating operations, and are, in any case, to be deplored, as they are quite avoidable. I thought it would be desirable, therefore, to put together the various points upon which reliance is to be placed in the microscopic diagnosis of pregnancy, and to point out the chief directions in which mistakes are liable to occur. Having had a fair amount of experience in these cases, I am able to furnish illustrations of the chief conditions which deserve notice, from material which has come under my own observation.

Products of conception may be either fœtal or maternal; the only fœtal structure which need be considered is the chorion, the only maternal structure the decidua vera.

Chorionic tissue is unmistakable in its characters when fresh and fairly well preserved. The villi of which it consists, in the main, are composed of—(1) A covering epithelium, (2) a delicate connective tissue stroma, (3) numerous wide capillaries. Of these the epithelial covering is unique in its characters, and therefore of prime importance from our present point of view. Elsewhere I have described it as follows:[1]—"In a well-preserved specimen of a young ovum it is easy to demonstrate the presence of a double epithelial layer covering all parts of the chorion. . . . The superficial layer consists of a stratum of granular, multinucleated protoplasm, in which no cell outlines can be distinguished. The whole layer stains deeply; its nuclei are small, round, and placed irregularly; its protoplasm is in places prolonged between the underlying cells of the deep layer. This is the plasmodial layer, now often called the *syncytium.* In the deep layer the cells are large and well defined, with oval nuclei standing with their long axes at right angles to the surface; the intra-nuclear network stains very distinctly; the peri-nuclear protoplasm is often retracted from the nucleus, and there is no basement membrane. This is the *cellular layer* or *layer of Langhans.* . . . During the early months the plasmodial layer shows great activity. Marked proliferation occurs in definite localised areas, resulting in the formation of nodes or buds of various sizes, or of club-shaped or broad-based processes upon the epithelium. These buds consist, like the layer itself, of masses of nucleated protoplasm. . . . Sections of processes are frequently seen as free islets of nucleated protoplasm in the intervillous spaces. . . . These proliferating areas represent the various stages and modifications of the process of budding, by which new villi are formed from the parent stems" (Fig. 1).

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[1] *Journ. Path. and Bacteriol.*, Edin. and London, 1896, vol. iii. p. 453.

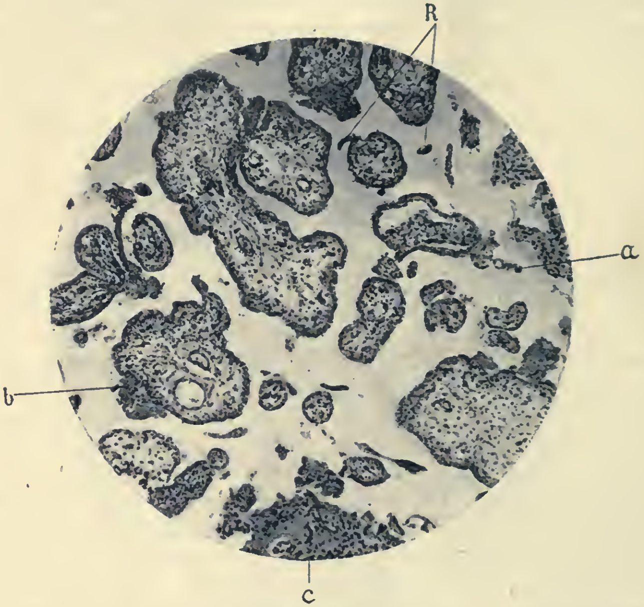

FIG. 1.—Villi from a three-months placenta. *a*, plasmodial buds; *b*, deposit of fibrin; *c*, cell islets of Langhans.

The characters of this structure are so distinctive that its recognition is quite sufficient to determine the nature of the tissues in which it may be discovered. It is important to remember, however, that only young villi show these points; in mature placental tissue the plasmodial layer is atrophied and incomplete, and displays little or no budding.[1] The presence of budding plasmodium, therefore, not only determines the existence of pregnancy, but also refers it to the earlier months of gestation. It is unnecessary to enter into a full description of the changes which occur in chorionic villi during the course of the gestation period; but the subject will be found fully described in the paper to which reference is given.

The maternal structure or decidua is the endometrium, modified by certain changes excited in it by the presence of a fertilised ovum in some part of the genital tract. It is important to bear in mind that decidual formation in the uterus occurs both in uterine and in ectopic pregnancy. In tubal pregnancy no decidual changes can, as a rule, be recognised by ordinary methods in the tubal mucosa, although there is no doubt of their occasional occurrence in interrupted patches, both in a gravid tube and in its non-gravid fellow of the other side.[2] For purposes of clinical diagnosis, however, these changes are not of service, and in the case of tubal blood clot, fœtal tissue is the only product of gestation ever definitely recognised.

The characters of decidual cells are so well known that description is unnecessary; a reference to Fig. 7 will suffice. The decidual membrane is a structure easily recognised by naked-eye examination alone; it is from 5 to 7 mm. thick, with a glistening, furrowed inner surface, on which the patent mouths of glands may at times be distinguished, and a rough outer surface, frequently studded with tiny cysts. If complete, the membrane forms a cast of the uterine cavity, triangular in shape, with two small apertures at the basal angles, corresponding to the entrance of the [illegible] aperture corresponding to the [illegible] entire cast, more often it is [illegible] ted together, the fragments will [illegible] Microscopically, it is character- [illegible] the connective tissue of the [illegible]

[illegible] may be regarded as pathogno- [illegible] in some part of the genital [illegible] rare instances occur in which, [illegible] formed and shed, no ovum can [illegible] inference is that it perished very [illegible] while the development of the decidua proceeded. It is doubtful, however, whether the occurrence of isolated clusters of large cells, in scrapings from the uterus, can always be held to be evidence of pregnancy. After all, the "decidual" cell is only a large connective tissue corpuscle, and possesses no characters by which it can be distinguished from similar cells of different origin. The supposed development of cells of malignant uterine growths from "decidual" cells is the origin of the name "deciduoma malignum," applied to the latest *enfant prodigieux* of continental pathologists. On the other hand, the converse error of regarding clusters of decidual cells in uterine scrapings as malignant sometimes occurs.

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[1] [illegible] London, [illegible] vol. ii. p. [illegible]

[2] [illegible] of Three Cases," *Brit. Med. Journ.*

The microscopic features of normal villi are represented in Fig. 1, taken from a placenta of the third month of gestation. The characters of their epithelial covering, already described, are fairly well seen; the stroma forms a loose reticulum, with numerous round and spindle-shaped nuclei, and supports the widely patent vessels. Many free sections of epithelial buds are present in the empty spaces which separate the villi, being the intervillous spaces through which the maternal blood circulates. Here and there are small clumps of fibrin adherent to the surface of the villi, and at (*c*) is a mass of considerable size, composed of cells derived from Langhans' layer and fibrin. Placental fragments, which have been retained for any length of time in the uterus, or which are found in tubal blood clot, always show marked modifications, which may render them unrecognisable as such to an unpractised observer. These modifications affect both the arrangement and structural characters of the villi.

As a rule, they occur singly or in clusters of two or three, surrounded by large areas of blood clot, which is often stratified, and usually shows some signs of organisation. When two or three villi lie together, they adhere. Their characteristic contour is always preserved, and they show up in transverse, oblique, or longitudinal sections through single villi, or through planes of division, in the manner familiar to those acquainted with normal placental tissue. The change in arrangement is, therefore, that there is the absence of the intervillous spaces.

In structural characters the villi have usually lost almost everything that is distinctive. The earliest structure to disappear is their epithelial covering. In Fig. 2 it will be seen that no trace of this layer remains. Frequently clusters of six to ten or more nuclei may be found at some point on the surface of a villus, representing a vestige of the plasmodial layer; and in the case of young placental tissue, isolated plasmodial buds may be here and there discovered in the blood clot, but not infrequently no trace of this structure can be anywhere discovered. Its place is, however, taken by irregular concentric rings of fibrin, deposited upon the villus from the maternal blood. Among the fibrin strands are a few small round nuclei of leucocytic origin. In Fig. 2 the small villus shows this fibrin deposit very clearly; and in the larger one, although less marked, it is quite evident round a part of its circumference. The stroma is markedly altered; its vessels have disappeared, leaving no trace whatever; the loose reticulum is replaced by a granular, structureless material, in which are numerous irregularly-placed nuclei. These nuclei vary in size and shape, but the majority are more or less elongated or spindle-shaped. The presence of these spindled-shaped nuclei is of the greatest importance, since they prove that we have here the remains of what was once connective tissue. The surrounding blood clot is traversed by strands of fibrin, which sometimes form a close reticulum, and sometimes are arranged in such a manner as to enclose areas of blood of various shapes and sizes. Around the villi there is always a richer deposit of fibrin than in other parts of the clot. Sometimes these fibrin rings and ovoids bear a certain resemblance to villi, and, as will be pointed out later on, may be mistaken for them. There is usually evidence of the clot having been formed by successive hæmorrhages, for in places it is retracted with degeneration of the blood cells, while in other places it is loose, with well-preserved red and white cells. Villi may be found in either the older or the more recent parts.

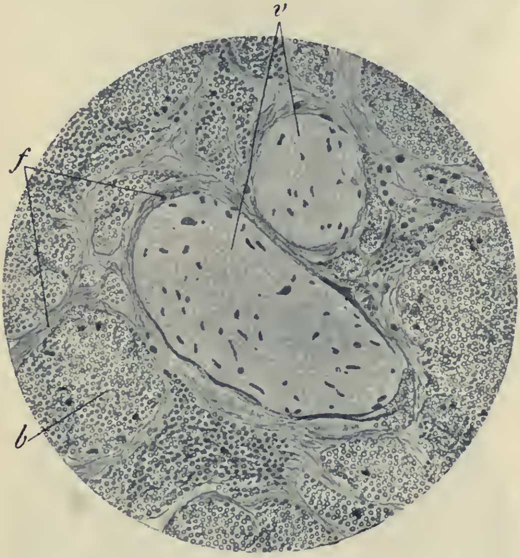

FIG. 2.—Villi from a uterine scraping. *v*, villi; *f*, fibrin; *b*, blood.—After Remfry.

The above mentioned changes are due to necrosis; they follow upon the death of the ovum, but do not cause it. It must be borne in mind, however, that an unhealthy ovum may perish from hæmorrhage, either in the uterus or the Fallopian tube, and therefore primary pathological changes may occasionally be

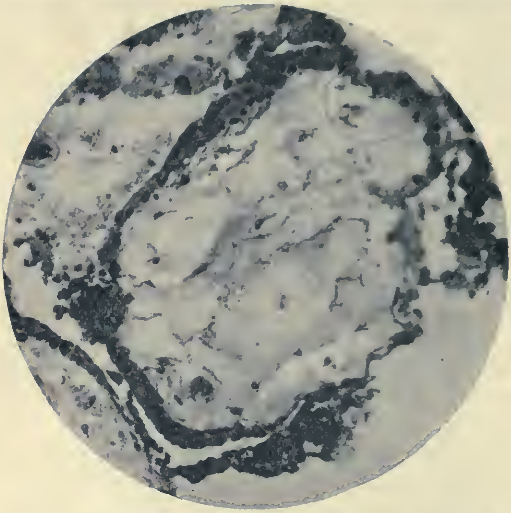

FIG. 3.—Villus from a tubal mole, showing vesicular hydatid degeneration.

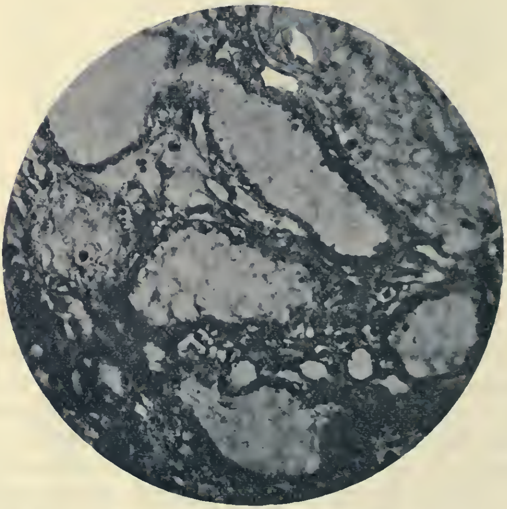

FIG. 4.—Fibrin deposit in blood clot, simulating altered villi.

definitely recognised in retained villi. Fig. 3 is taken from a tubal mole, and the villus shown in the illustration displays the changes in the stroma characteristic of vesicular or myxomatous degeneration of the chorion. The epithelial covering is well preserved, and there is little or no blood clot in its neighbourhood, and no deposit of fibrin upon it. The preservation of the chorionic epithelium is to be explained partly by the fact that the mole was of recent formation, and partly by the fact that the villus in the illustration was lying clear of the effused blood. In other parts of the same specimen villi may be seen, which correspond to those shown in Fig. 2, and have not been affected by the degeneration of the stroma. This, of course, is quite in accord with what we know of the anatomy of this affection of the chorion, all the villi being never found diseased in the early stages.

Fig. 4 is an illustration of the forms sometimes assumed by fibrin rings and ovals in blood clot. They bear a certain resemblance in contour to villi, and I have known them sometimes erroneously represented to be villi. As a rule, blood cells may be recognised within the fibrin enclosure, which of course decides their nature; but at times, as in the illustration, the blood cells have almost entirely disappeared, leaving the spaces practically empty. The absence of rod-shaped or spindle-shaped nuclei will suffice, as a rule, to show that they are not villi, even if all traces of blood have been removed from them. Further, it is rare to find that a considerable number of retained villi fail to show some trace of their epithelial covering in some part; and this structure, being easily recognised, should be carefully looked for in any difficult case.

Another error may arise in the case of tubal blood clot, and that is, that sections of the plicæ of the tubal mucosa may be mistaken for chorionic villi. I have known a specimen exhibited to a scientific society as a case of tubal pregnancy, the diagnosis depending upon a bit of tubal mucous membrane caught in a mass of blood clot; and in a recent work on abdominal surgery published in this country, the same error is perpetrated in an illustration. Fig. 5 is taken from a tubal mole; it represents an oblique section through a fold of mucous membrane, which appeared lying free in the blood clot, closely adjacent to some undoubted chorionic villi. In general shape and contour it is not unlike a villus; it has a definite epithelial covering, a vessel containing blood at one end, and a stroma rich in small round nuclei. The points of distinction are—(1) The epithelial nuclei are elongated and arranged with their long axis vertical to the surface; further, with a higher power, the outlines of the columnar

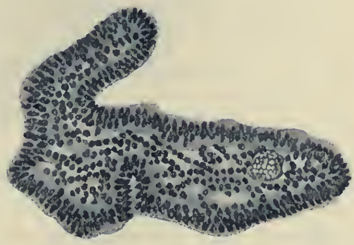
FIG. 5.—Section through a fold of tubal mucous membrane, simulating a villus.

cells become apparent. (2) The connective tissue stroma forms a closer reticulum, and shows a greater preponderance of round over spindled-shaped nuclei than the chorionic stroma. (3) It is sometimes possible to trace, in serial sections, the origin of the structure in the tubal wall, and its continuity with the elements of the latter. The significance of this error is greater than may at first sight appear. It is now agreed that a certain number of cases of hæmato-salpinx occur in which no chorionic tissue can be recognised by practised observers. This negative result is hardly open to the objection usually urged against such conclusions, namely, that the chorionic tissue may have been there all the same, because we know that villi may be preserved for many months in blood clot which remains free from infection, and, if present, can hardly be missed. But if tubal mucous membrane be mistaken for villi, we may be classing as tubal gestations conditions which have quite a different origin, and thus impeding an important step in the analysis of the morbid conditions of the Fallopian tubes.

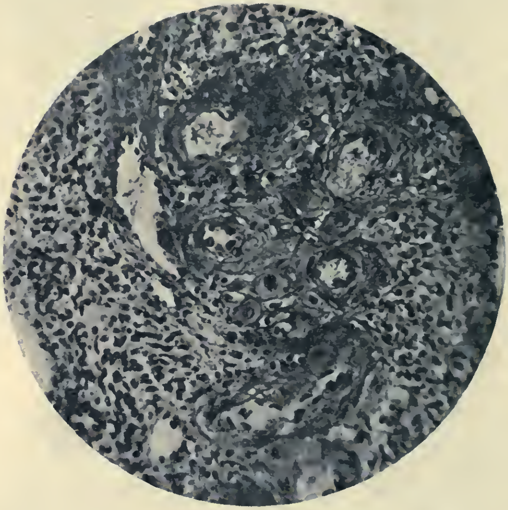

FIG. 6.—Uterine scraping, showing decidual cells in centre.

Maternal products of conception only occur as relics of a uterine pregnancy. In tubal moles I have never found decidual cells, and their recognition is not a point of any practical importance in these cases. It is different with fragments obtained by curetting, or expelled naturally from the uterus. The detection in these tissues of decidual elements is a point of importance as evidence of a preceding gestation, and also in doubtful cases they need to be carefully distinguished from sarcoma cells. Occasionally an entire cast of the uterus, composed of decidual elements, is formed, and expelled, in cases of extra-uterine pregnancy; and casts similar in all respects to these occur in rare instances as relics of a uterine pregnancy, from which the fœtal elements have entirely disappeared. For this latter condition I have suggested the name of "spurious abortion," to distinguish it from the anatomically distinct condition known as "missed abortion."

Fig. 6 is from a photomicrograph of a fragment removed by curetting in the case of a woman who had persistent hæmorrhage following an incomplete abortion. Other fragments showed altered chorionic villi. In the figure is shown a piece of the endometrium, at the centre of which is a cluster of decidual cells, characterised by their size, their large nuclei, and the considerable amount of their perinuclear protoplasm. Around them is a considerable hyaline deposit, and some of the decidual cells themselves are undergoing the same hyaline degeneration. The surrounding endometrium is rich in small round nuclei and spindle cells, and other parts showed the changes characteristic of the glandular form of endometritis.

It is necessary to emphasise the fact that appearances such as those shown in Fig. 6 are not of themselves sufficient to prove the pre-occurrence of pregnancy. Large connective tissue corpuscles, closely resembling decidual cells, may be occasionally found in a diseased endometrium apart from pregnancy, and, as already stated, may be also closely imitated by sarcoma cells. One or two observers have succeeded in exciting decidual formation in the uterus by mechanical irritation; and after acute phosphorus poisoning in the human subject, a pseudo-decidual formation has been described. I have myself, in two cases, found similar large cells in scrapings from the uterus of women who had never to their knowledge been pregnant; but it must be admitted that the exclusion of antecedent pregnancy is, in every case, an extremely difficult matter, except at the extremes of life. On the whole, however, there is good reason to hold that the occurrence of scattered large cells in the endometrium does not necessarily imply antecedent pregnancy. In the case illustrated by Fig. 6, the diagnosis was confirmed by the discovery of villi in other fragments.

Fig. 7 is an illustration from a case reported fully by the late Dr. Remfry.[1] The patient had suffered from hæmorrhage for six weeks, and, after dilating the cervix, a mass was found attached to the wall of the uterus, and removed, which consisted in part of villi and blood clot, and in part of the cells represented in the figure. These cells, being submitted to a pathologist, were held to be sarcoma cells, and the uterus was in consequence removed without delay. Examination of the organ, when removed, failed to reveal any trace of new growth, and more careful examination by a committee of the Obstetrical Society, of which I was a member, of the intra-uterine mass removed at the prior operation, showed it to be a placental polypus, and the cells shown in Fig. 7 to be in reality decidual cells. I have said that sarcoma cells may closely imitate decidual cells, and errors so deplorable as this can only be avoided by attention to general principles rather than to the shapes and sizes of particular cells.

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[1] *Trans. Obst. Soc. London*, vol. xxxviii. p. 223; xxxix. p. 2.

A word should be said finally about decidual casts. It has long been known that closely following the death of a tubal ovum, from hæmorrhage or other accident, a cast of the uterus is frequently discharged, either entire or in fragments, the structure of which corresponds closely to that of the decidua vera of uterine pregnancy. So closely was this phenomenon connected with extra-uterine pregnancy, that it was held by many to be a pathognomonic sign. In consequence, we find two cases on record, in which abdominal section was undertaken, largely, or chiefly, upon the supposed significance of the discharge of a decidual cast from the uterus.[1] In neither of these cases was extra-uterine pregnancy discovered, and in one case there was no morbid condition whatever present. In the other there was a small ovarian cyst, which had been mistaken on physical examination for the gestation sac. A third case has been recorded by myself,[2] in which operation was avoided. Examination of the cast in my case showed that the membrane was composed in the main of "decidual" cells, and

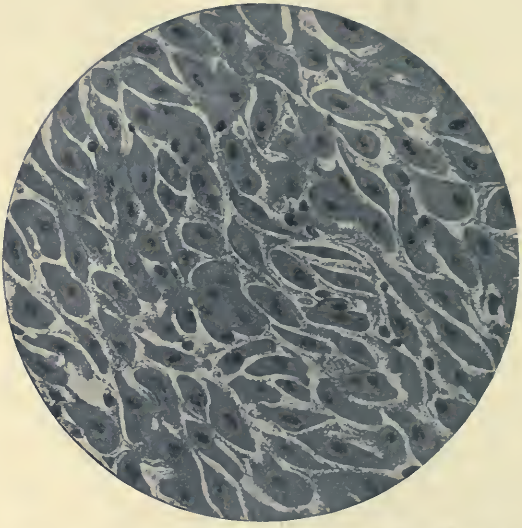

FIG. 7.—Cluster of decidual cells in scrapings from a case of placental polypus.—After Remfry.

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[1] *Trans. Obst. Soc. London*, vol. xxxvi. p. 335; vol. xxxvii. p. 385.
[2] *Ibid.*, vol. xxxviii. p. 132.

in general characters corresponded pretty closely to the decidua vera. There is in fact no means of distinguishing it by microscopic examination from casts obtained in cases of extra-uterine gestation, or from fragments of decidua vera; and the only essential distinction from the decidua of uterine pregnancy is the entire absence of admixture of fœtal (chorionic) elements, that is to say, no placental site can be discovered. From the casts of membranous dysmenorrhœa it is readily distinguished, for while in the latter there may be found scattered large cells, the connective tissue stroma of the endometrium shows inflammatory changes, but no extensive large-cell formation.

From these considerations it is apparent that serious error is much more likely to arise in connection with the maternal than with the fœtal products of gestation. Decidual cells are in themselves less conclusive evidence of gestation than villi, and from their likeness to cells of malignant origin an error may be attended with disastrous consequences, whether that error be in the direction of mistaking decidual for sarcoma cells, or *vice versâ*.

REMARKS ON DYSPEPSIA AND A DIET.[1]

By A. Lockhart Gillespie, M.D., F.R.C.P.Ed., F.R.S.E., *Medical Registrar, Edinburgh Royal Infirmary.*

I will only venture to hazard a few remarks towards the subject of discussion, conscious that the importance and value of the contributions already made to it by so many well-known experts must render anything I can say of little weight. I have on the billet the title of a paper dealing with the actions of diets and drugs upon the chemical and bacteriological processes in the intestinal tract, which I had intended to read as my offering; but as the time left at the disposal of the section is so circumscribed, it would be unwise in me were I to attempt to do so. As the paper took years to compile, months to write, and would require an hour or so to read, it were better left alone.

In connection, however, with one of the questions touched upon in it, namely, the influence of intestinal fermentation upon healthy (if it can ever be so, under the circumstances) gastric digestion, I may say that lately I have been surprised at the frequency with which patients come complaining of some fancied disorder of the stomach, for which they have been treated in the usual manner, who prove on investigation to be suffering primarily from the metabolic misdeeds of bacteria in the bowel.

They undoubtedly presented symptoms of gastric disturbance, quite independent of hepatic troubles, while the state of the intestinal contents was usually but not invariably accompanied by auto-intoxication. By humouring the stomach with rest; with milk in small quantities and frequently, either in a natural condition, or variously diluted and modified, thereby diminishing the numbers of bacteria admitted, or altering their species; by the use of calomel to destroy the bacterial forms in the contents of the duodenum and jejunum; of creasote, guaiacol, or other similar substances to deal with those in the ileum; and of salol to act on the micro-organisms in the ileum and large intestine; by prohibiting all malt liquors and fortified wines; allowing, if stimulants are advisable, whisky diluted to 4·5 per cent. of alcoholic strength (1 oz. with 10 oz. of water), or champagne in moderate quantities;—by such measures a rapid subsidence of all the symptoms is promoted. Cheese is often of benefit in this condition, given on each occasion in such amounts as the stomach can comfortably deal with. If this marvellously adaptable organ (considering the persistent ill-treatment, lay and medical, meted out to it) can digest cheese in fair quantities, its use may be pushed.

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[1] From the discussion on "Treatment of the Diseases of the Stomach," in the Section of Pharmacology and Therapeutics, British Medical Association, July 1898.

Shakspeare was sensible of the attributes of cheese in the process of digestion, and alludes humorously to it in "Troilus and Cressida" (Act ii. Scene 3), when he makes one of his characters exclaim—

"Where, where!—Art thou come? Why, my cheese, my digestion, why hast thou not served thyself in to my table so many meals?"

Cheese is an excellent breeding-ground for many of the lowlier members of both the vegetable and the animal kingdoms. How can it, full of the organic agents of fermentation, check organic fermentative changes? Cheese undoubtedly possesses a considerable power of arresting or inhibiting those bacterial processes which are the actual agents in the production of intestinal dyspepsia, with its signs and symptoms,—unless, indeed, it prove of too irritating a nature towards the mucous membrane of the alimentary tract. This power, I believe, is due to the antagonistic properties of two classes of organisms.

It has been suggested in Germany with regard to the anti-fermentative action of cheese, and of kefir, that the carbohydrate moiety, although so small in such bodies, is the active antiseptic agent; I believe that the bacteria themselves form the pharmacological *basis* of the cheese prescription. The acids formed by these bacteria are inimical to putrefactive processes. The fermentation of the one class of organisms is incompatible with the fermentation caused by the other class. The great aim to strive for in excessive intestinal fermentation, *alias* putrefaction, is the destruction of the causal agents. Two methods are available—to forcibly drive them out of the bowel, or to inhibit their growth *in situ*. These two methods should be used together. The first needs no further notice. The second may be carried out by the use of antiseptic drugs, by dietetic control of the bacteria swallowed, or by measures taken to raise the proportion of free hydrochloric acid in the stomach to a strength sufficient to inhibit the growth of, or prove fatal to micro-organisms partial to alkaline media, whether the acid-affecting forms are hindered by it or no. The ordinary conditions present in the contents of the bowel bear witness to the greater supply and prowess of the acid-fermentative agents. The reaction of the contents, save perhaps in a short portion of the lower end of the duodenum and upper part of the jejunum, probably are always acid, even if only slightly, in health—the cause, the metabolic processes of bacteria-producing organic acids as their natural output; the effect, a controlling influence over the growth of their kindred, but still their rivals, the bacteria of putrefaction. The first class, as a rule, produce no poisonous substances, unless the alcohol they often form from carbohydrates be considered as such; the second class live largely on proteids, and, being extravagant by nature, use but little in support of their bodies, while manufacturing an excessive amount of unnecessary and innutritious substances to obtain that little.

Some experiments which I have carried out on dogs seem to show that calomel acts upon the bacteria in the stomach contents, and in the higher parts of the small intestine; creasote and other antiseptic bodies of the same type act most powerfully below the jejunum; while the action of salol does not become marked until the middle of the ileum is reached. On testing the contents of progressive sections of the alimentary tract of the dog, killed two or three hours after the administration of a final dose of salol, no evidence of its decomposition could be obtained above the mid-ileum. Theoretically, salol is neither decomposed in nor absorbed from the stomach; experiment, however, has demonstrated that it can pass, presumably unchanged, through the stomach walls, and become altered in the blood, its derivatives appearing in the urine even if prevented from entrance into the gut. This has been shown in the dog. The duodenum was severed close to the stomach, and the pyloric end of the stomach pulled forward through the abdominal wall. Although it was impossible for the drug to reach the bowel, the dog's urine contained salicyluric acid, notwithstanding the complete failure of the test for that body in the contents of the stomach.

Calomel and salol, then, may be regarded as antiseptics acting in different spheres of influence. I usually commence with a small dose of calomel, followed by a saline purge; and begin on the following day with 8-gr. doses of salol thrice daily. A large dose of calomel is not required. It is a rather remarkable fact with regard to that drug, that the production of the perchloride of mercury, which must be the form through which it exerts an antiseptic action, and for which it is indebted to the hydrochloric acid of the gastric juice, does not appear to be proportionate to the size of the dose of subchloride. The transformation of a very minute portion of calomel into the perchloride is quite sufficient for all antiseptic requirements. After commencement of the salol treatment, a dietetic programme may be begun.

I have little or no faith in strict, hard-and-fast, empirical diets, and in this connection both gastric and intestinal dyspeptic conditions are alluded to. The habit of laying down unalterable dietetic rules, unalterable for indefinite periods—until the patient, may be, gets well—leads to a practice of giving all patients who have any gastric trouble the same diet and the same limitations. Each dyspeptic is different from all others. Each case possesses some little idiosyncrasy, at least, which may be profitably taken into account. There is no doubt that many patients progress far more satisfactorily when they are entrusted with part of the responsibility for the proper conduct of their course of treatment, and when encouraged by a hope of achieving a return to normal health partly by their own endeavours.

How often a patient, questioned as to his malady, for which he has suffered at the hands of many, confesses that he is ignorant of its nature, or of the opinions as to it held by those whom he has formerly consulted. He has received advice, been given rules in great number, or been put on a very restricted diet, but has never been informed what the reasons were which led to their adumbration. He knows not why he must not eat cabbages, although cauliflower tops or young turnips are *en règle*; why tomatoes and strawberries are anathema maranatha, bananas permitted and innocuous. This, of course, applies more particularly to advice given to patients seen in the consulting-room. Surely it is preferable and of greater promise to explain the why—the extent of the information varying in proportion to the state of the nervous system evinced by the patient, his cerebral intelligence, the condition of his inhibitory or acceleratory mechanisms; the how—based upon the why, and most useful when scriptory; the when—with adaptation as far as possible to the ordinary habits of the patient, many of which cannot be altered with impunity; and, lastly, the what—varying with each patient, and incompatible with any rigid dogmatism on the part of the adviser.

You will probably say that these statements are truisms and platitudes, but they are re-told because I have lately met with patients who were suffering from a diet, not from a disease. An example may be instanced. A gentleman had consulted a physician nine months before for an attack of dyspepsia. He was advised to restrict himself to a very meagre diet, and led to believe that any future transgression would be dangerous to health. The original attack had been of a slight nature. Nine months later he had become nervous, despondent, even melancholic. His diet, which he had understood to be absolutely necessary for well-being, haunted him. To be able to eat only the one or two forms of food allowed him during the remainder of his days! Undoubtedly he was to blame for not attempting a fuller menu, but still more was the physician who omitted to state any limit of time for the cessation or for the amplification of the diet-sheet. I am afraid my treatment was unprofessional and scarcely orthodox. He was set down to a good meal, the first he had had for months, played a good knife and fork, was none the worse of it at the time, and from its lessons soon recovered his spirits and health. Before this he was timorous, oppressed, filled with loathing for the articles of food allowed him, and for his dietetic future; afterwards his mind was cheered by visions of untrammelled choice of culinary tit-bits, should he avoid everything which gave him the slightest warning of disagreement. To quote the "divine William" again, a vivid description of the effects produced on patients, especially of nervous habit, by a "diet" is to be found in Henry IV., Part I. Act ii. Scene 3, although the lines of the text apply in truth to dyspeptics in general:

"Tell me, sweet lord, what is't that takes from thee
Thy stomach, pleasure, and thy golden sleep?
Why dost thou bend thine eyes upon the earth,
And start so often when thou sitt'st alone?
Why hast thou lost the fresh blood in thy cheeks,
And given my treasures and my rights of thee
To thick-ey'd musing and curs'd melancholy?"

Just such a one have I seen cursed with melancholy and a diet.

Granted that a rigid dietary often removes the cause of the original disease, and if only continued for a limited period, with permission to increase it as far as it is compatible with comfort, does an immense deal of good. By a rigid diet I do not allude to
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simple rules as are amply sufficient to guide them in the course they should rationally pursue? Some there are who can form no clear conception of what is required of them; few are without a regard for their prospective gastronomic abilities and allowances so pronounced as to neglect active endeavour in the present, with a view to personal pleasure in the future. Most patients may be given some degree of individual licence; should be encouraged not only to perform their daily duties, but also to cultivate a hobby to fill up their unofficial time; should read Dickens, Rudyard Kipling, Barrie, Longfellow's "Excelsior," and similar works; not poems and plays by Ibsen, novels of the latest *fin-de-siècle* hopeless type, nor those works of so-called fiction written for a purpose, the unriddling of which simulates the solving of a conundrum.

The dyspeptic, interested in the progress of his cure, and inquisitive about what his next forward advance may be, forgets to be depressed by the dismal future before him, or to picture an infinite succession of diurnal meals of sloppy food, a vista necessarily suggesting the question, Is such a life worth living? When encouraged, on the other hand, by the prospect of enjoying in time the pleasures of the table—*recherché* dishes, treasured vintages; should he be careful only to add from time to time such articles of diet as personal trial shows are tolerable; be self-denying at the start, which he will be with a greater serenity of mind, aware that more may follow; and sustained by evidence of his advancing capabilities, though rigorously eschewing such things as do not agree, and only venturing to try them again when his digestive powers have increased—he will exhibit more satisfactory progress than if he had been restricted to a narrow menu for an indefinite period. The primary lesion may perhaps be cured by the latter method as quickly as by the former, but the indefiniteness of its goal works mischief; while the other removes the dyspepsia, benefits the general health of the patient, and prevents melancholic apprehensions.

My picture, I fear, has been touched in from too strong a palette; the high lights too brightly, the shadows too opaque. If it had been painted in half-tones, although with the same pigments, it might not have been so impressionistic, but would perhaps have formed a picture truer to nature. The subjects presented by medical science are now so numerous and so far-reaching, while each individually exhibits so enormous a range, that each observer is forced to confine his studies on any special subject to some small portion of the whole—a fact which must serve to explain the paucity of my themes. But they have been drawn from what are to me "attractive bits," and I trust that their delineation may prove of service to those who advise and to those who possess disturbed digestions.

REMARKS ON THE TREATMENT OF "DIFFICULT STRICTURE."

By A. A. Warden, M.A., M.B., C.M., *Resident Surgeon, Hertford British Hospital, Paris.*

There are to-day but two methods used in the treatment of stricture—excision and dilatation. Of these, the former—excision—may be put aside, not because it is a negligeable quantity, but because it is an operation to be reserved for some of those few strictures that are traumatic in origin, and exceedingly limited in extent. The great majority of strictures are, of course, gonorrhœal in origin, plural in number, and involve a considerable area of the mucous membrane of the urethra.

Their treatment is dilatation, a process that may or may not be preceded by internal urethrotomy. The essential element, however, in the treatment is the subsequent dilatation, for no stricture was ever yet cured, save in a most temporary sense, by an internal incision alone.

So many, so varied, and so ingenious are the modern methods by which we may succeed in obtaining complete dilatation of a stricture, *i.e.* its true cure, no matter how narrow its calibre or how dense its structure, that I venture to give the details followed in a difficult case I have had under my care,—details that will illustrate general principles in the treatment of this very important, because so common, and so dangerous ailment.

The patient, Thomas B., æt. 53, interpreter, Paris, was admitted into hospital with all the constitutional symptoms that a chronic stricture produces, from the long-continued intoxication due to the partial retention of urine. The usual local symptoms were, of course, present—pain and difficulty of micturition, great frequency (rising never less than five times during the night), and, in addition, such constitutional disturbances as loss of appetite, coated tongue, dyspepsia, diarrhœa, hæmorrhoids, great mental depression, impotence, etc.

Previous history.—Patient's first gonorrhœa dated back to thirty-five years before. He had since had several other attacks, the last about fifteen years ago. None had been adequately treated, and had dragged on the protracted course that, even now, this unfortunate malady is too frequently allowed to run.

In March 1891, more than twenty-five years after his first urethritis, his symptoms of stricture seem to have appeared, a divided, twisted stream, difficulty and slowness in micturition, with occasional attacks of complete retention and incontinence.

In 1894 he was under treatment for four months in the Royal Infirmary, Liverpool, when several metallic instruments were passed, causing some pyrexia and delirium that continued for several days. He did, however, improve during three or four weeks after leaving hospital, but his symptoms speedily returned. He was again under treatment in

Manchester and Salford hospitals, in the latter of which small bougies could only be passed while the patient was in a hot bath. Neither there nor in Nottingham, whither he had now wandered, was the stricture completely dilated.

Upon admission on November 26, 1897, treatment was at once begun, but for the first fortnight nothing but a series of failures could be chronicled.

Examination of the urethra with the exploratory *bougies à boule* (Fig. 1) showed a series of strictures, beginning in the penile urethra, through the first of which a No. 10 could be passed; but through a second scrotal stricture, the smallest filiform bougie could not be induced.

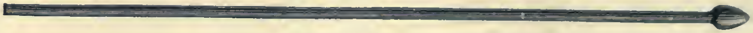

FIG. 1.—Exploratory bougie à boule.

In spite of hot baths, sedatives such as Dover's powder, during the next three days it was impossible to get the smallest gum-elastic bougie introduced. This difficulty, it may be parenthetically remarked, is of absolutely no importance, for one has only to go on trying patiently and carefully upon alternate days, and the resistance of any stricture will be overcome. It may be doubted if there is such a thing as an *impassable* stricture.[1]

29*th November*.—Filiform bougie (Fig. 2) passed and tied in for twelve hours.

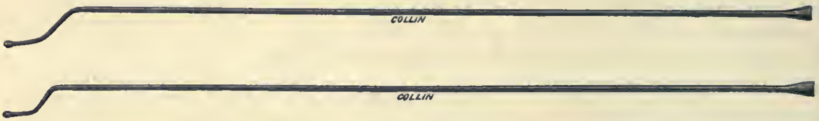

FIG. 2.—Filiform bougies ("bayonet" form)

The effect of tying a small bougie in a stricture is now well known, and should always be practised in a difficult stricture. If left in for forty-eight hours, the effect is remarkable, and bougies half a dozen sizes larger may at once be easily passed. It is, however, very transitory.

Tying the bougie in is always a difficulty, and it cannot be said that any method is free from objection.

1. Attachment to the pubic hair—simple, but obviously inconvenient.

2. Attachment to a body-bandage which has been passed round the patient's neck, and then round each hip.

3. Attachment to a small circular vulcanite collar. The collar is passed down to the base of the penis, and attached by tapes round patient's hips and round his waist. The rim of a pill-box may thus be simply and usefully applied.

4. Simplest and best—if the patient's prepuce be of average length—is to attach some silk to the bougie, pushed well into the urethra, and

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[1] See author's paper on "Examination of Normal and Strictured Urethra, and Treatment of 'Dilatable' Stricture," in the *Glasgow Med. Journ.*, Sept. 1897.

tie the free ends of the silk to a pledget of cotton-wool, over which the prepuce is drawn. This is both safe and effective, may be frequently changed, and therefore is cleanly.

2nd December.—Filiform bougie tied in for twelve hours, with little effect.

3rd December.—Filiform bougie tied in for forty-eight hours.

5th December.—Bougie removed, and No. 7 passed.[1]

7th December.—Impossible to pass any bougie. This shows the transitory nature of the effect of tying a bougie in for forty-eight hours.

8th December.—Filiform bougie passed, left in half an hour, and followed by No. 7.

10th December.—Absolute failure to pass any bougie. I now determined to make further dilatation possible by means of the operation of internal urethrotomy with Maisonneuve's instrument (Fig. 4), with, however, the many improvements suggested by that great master's greater pupil, Professor Guyon.

11th December.—Internal urethrotomy performed. After washing the glans, prepuce, and meatus, and syringing out the anterior urethra, by means of a syringe fitted with Janet's glass olive (Fig. 5), I cocainised the anterior urethra with Guyon's instillator (Fig. 6) and syringe, and a 2 per cent. solution of cocaine, passing the *boule* of the instrument up to the first stricture.

The instruments for the operation itself are simple, and, in the order required, as follows:—

1. A filiform bougie fitted with a

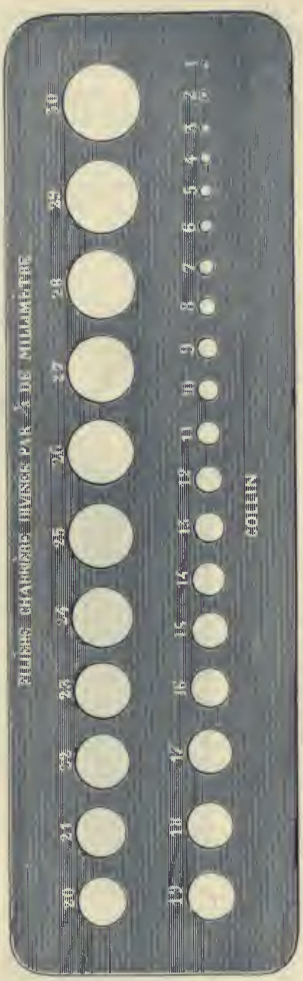

FIG. 3.—French scale.

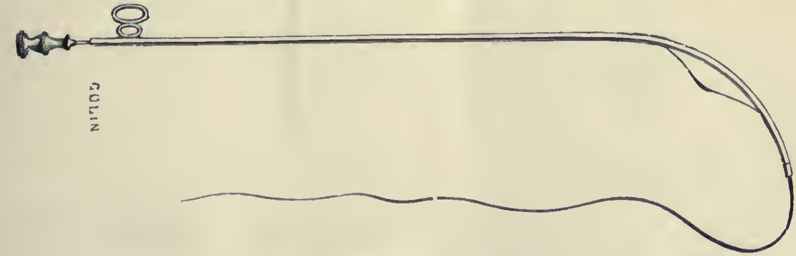

FIG. 4.—Maisonneuve's urethrotome.

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[1] No. 7 in French scale (Fig. 3), in thirds of a millimetre.

metal thread at base, to act as conductor for the other instruments that have to be passed.

2. A straight metallic stem which is screwed on to the bougie, and which shows, on partial introduction into canal, whether the bougie be safely within the urethra and bladder; and which also, after the operation, serves as guide for the catheter it is intended to tie in to protect the incised urethral wall.

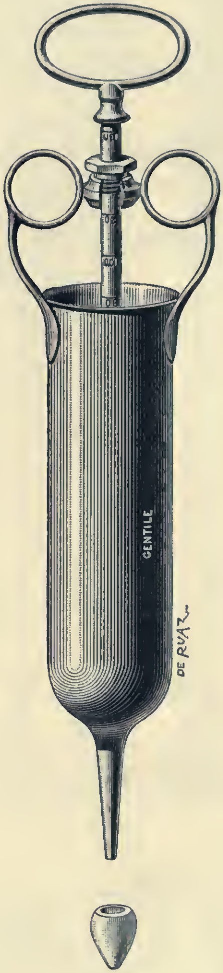

FIG. 5.—Janet's syringe and olive.

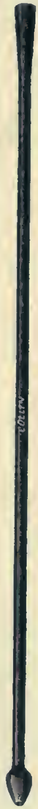

FIG. 6.—Guyon's instillator.

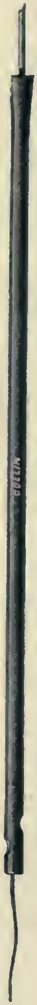

FIG. 7.

3. The curved grooved metallic conductor, which is screwed on the bougie and at once passed down the urethra into the bladder.

4. The triangular-bladed knives or urethrotomes, in three sizes.

5. The square-cut two-eyed catheter (Fig. 7), which is to be left in for forty-eight hours subsequent to the operation, and the plug of wood to close it.

The operation.—The operation is not a very painful one, and may be safely done with cocaine, not more than 1½ grs. of which should be injected in all. In such moderation there is safety. Chloroform anæsthesia in nervous patients is best, but very little is required. The steps of the operation involve merely a repetition of the instruments already enumerated, in the order in which they are required. Of course it is not an aseptic operation, the urine flowing over the wound making that impossible, and sometimes there will be discharge of pus from the urethra, but it is slight and soon passes. It is well to protect the urethral wall by leaving in a fair-sized gum-elastic catheter, Nos. 18, 20, or 22, for the first forty-eight hours. If the bladder be infected, it may be washed out with boracic acid or weak silver nitrate solution (1 in 1000), by means of this catheter.

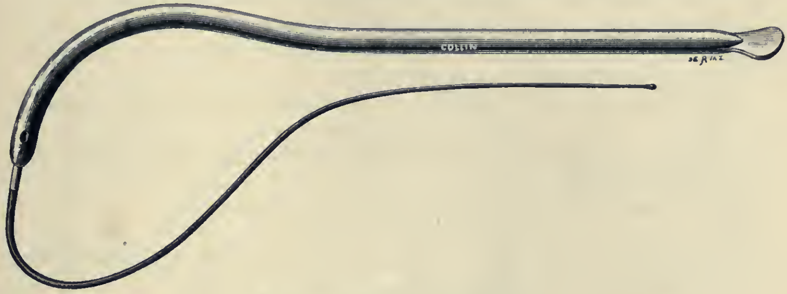

FIG. 8.—Beniqué on conductor.

13th December.—Catheter removed.

On each evening, patient's temperature had risen to 100°·2, but now subsided. The discharge of blood and pus, due no doubt to the large surface of urethra cut by the urethrotome and the irritating nature of the urine, did not entirely cease until about the 20th December, and, though making water easily, patient still complained of considerable pain during micturition. No instruments were therefore passed until

27th December, when bougie No. 6 was passed.

29th December.—No. 6 left in four hours, and No. 8 passed. No. 10 also, tightly grasped by stricture.

3rd January.—No. 6 passed and tied in for forty-eight hours. That a *bougie à demeure* was thus again necessary proves completely, I think, the obstinacy of the case. Its value was striking.

5th January.—Bougie No. 6 removed, and Nos. 8 and 10 passed easily. No. 12 was tightly grasped.

7th January.—Small metallic bougies of the form known as Beniqué were now begun, and Nos. 18, 20, 22, 24 passed easily.[1]

10th January.—Bougies Nos. 24, 26, and 28 (Beniqué's).

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[1] Beniqués are scaled in sixths of 1 mm., and therefore a 24-Beniqué is equal to a No. 12 gum-elastic bougie or catheter.

12th January.—Bougies Nos. 28 and 32 with some difficulty.

14th January.—Bougie No. 6 tied in for forty-eight hours.

16th January.—Bougie No. 6 removed, and Nos. 34, 36, 38 passed upon conductor (Fig. 8).

19th January.—Impossible to pass No. 38 without conductor. Nos. 36, 38, and 40 passed easily upon conductor. No. 40 was left in three-quarters of an hour, and caused great pain. Temperature at night rose to 100°·4, but fell next morning, and did not again rise.

I repeatedly attempted to pass the Beniqués without the aid of a conducting filiform bougie, but found it impossible, without exerting force and causing pain that was unnecessary, as the *bougie conductrice* seemed to feel its way and guide a large Beniqué with an ease and success that could not otherwise be attained.

22nd January.—Filiform bougie tied in for thirty-six hours.

23rd January.—Beniqué's Nos. 38 and 42 on conductor.

26th January.—Beniqué's Nos. 42 and 44 on conductor.

28th January.—Beniqué's No. 44 passed without conductor, but with difficulty and pain.

30th January.—Beniqué's No. 46 passed on conductor with ease and little pain.

Patient went out a week later, able to pass upon himself a full-sized gum-elastic bougie.

His expression was, "he felt ten years younger."

The manœuvres which I consider of importance in all such difficult cases of stricture are—

1. The tying in of a small bougie for forty-eight hours.
2. The use of small metallic bougies with gum-elastic conductors.
3. The operation of internal urethrotomy.

Without recourse to each of these three simple yet important procedures, I am quite sure it would have been impossible effectually to have dilated this stricture. With regard to internal urethrotomy, an operation regarded with considerable suspicion in England, I think Sir Henry Thompson's opinion still worth quoting.

On p. 165 of the 4th edition of his work upon stricture (1885), he says—

"The sum of my experience is the expression of a strong conviction that internal urethrotomy, fully and completely performed, should be resorted to as the best and safest treatment of stricture, as soon as the easy use of the bougie fails to maintain the urethra patent, or to allay signs of irritation in the bladder arising from the obstructed urethra. It is the best means, not only for relieving urethral obstruction and its painful symptoms, but for insuring the future sound condition of the more deeply-seated organs.

CLINICAL RECORDS.

SOME RARE FORMS OF ABDOMINAL TUMOURS.

By James Oliver, M.D., F.R.S.E., F.L.S., *Physician to the Hospital for Women, London.*

Case 1.—*Cyst of Gartner's duct.*—Nellie B., æt. 24 and single, has menstruated regularly since the age of 15. During the last four months severe pain in the lower abdomen has been experienced in association with menstruation, and simultaneously there has been a marked increase in the amount of the menstrual discharge. Since the last period, three weeks ago, patient has complained constantly of pain in the lower abdomen.

Physical signs.—The abdomen is rather prominent, and is occupied centrally by a small globular swelling, which extends from the pubes to within an inch of the umbilicus. In the line of the linea alba the percussion note is dull from the pubes to the level of a spot located midway between the pubes and the umbilicus. Both flanks are resonant. The bladder was emptied by means of a catheter.

Vaginal examination.—The cervix uteri is very low; it is felt just within the entrance to the vagina. The os is directed forwards, and is not open. Anteriorly, and on the right side, the vaginal roof is pushed down by a swelling, which is a portion of the abdominal tumour. Anteriorly the vaginal swelling extends almost to the summit of the cervix uteri. The body of the uterus cannot be easily defined, but it is located to the left of and somewhat behind the tumour. The tumour is fluctuant.

Operation.—The abdominal wall was incised mesially from a spot situated midway between the pubes and the umbilicus to within an inch of the former anatomical mark. The upper portion of this incision opened the peritoneal cavity to a very slight extent; it was then remarked that the peritoneum was reflected directly from the upper border of the tumour to the anterior abdominal wall, and that the anterior surface of the tumour possessed no peritoneal covering, but was incorporated with the anterior abdominal wall. The opening in the peritoneal cavity was then carefully closed by a continuous catgut suture, and thereafter the abdominal incision was cautiously deepened over the tumour, until the latter was cut into, and amber-coloured fluid began to escape. The opening into the cyst was enlarged, and the cavity was explored by the index and middle fingers. It was then discovered that the cyst had developed very low down in the substance of the right broad ligament, and that towards the left side it was incorporated with the anterior surface of the uterus. The inner lining of the cyst was smooth, and looked like mucous membrane. The cyst wall could not be shelled out. The cavity was drained, and the patient made an excellent recovery. The tumour contained nearly 20 oz. of fluid.

Remarks.—Taking into consideration the physical signs, the peculiar appearance of the lining membrane of the cyst, and the relationship of the cyst wall to the anterior abdominal wall and to the uterus, it was evident that the tumour was neither a parovarian cyst nor a cyst of the ovary which had penetrated the broad ligament. In mammalia the middle part of the Wolffian duct is known as Gartner's canal. It is a strong, slightly undulated tube, which is incorporated with the wall of the lower third of the uterus and with the vagina; upon the latter structure it is lost. It persists in the females of some monkeys, the pig, and many ruminants.

Case 2.—*Cyst of the mesentery.*—Ellen M., æt. 36, and married nine years, has had one child and one miscarriage; the child was born eight years ago. Menstruation recurs regularly, and she was last unwell three weeks ago. For fifteen months patient has complained of pain and of a throbbing sensation in the left half of the abdomen, and for the same length of time she has remarked that her abdomen has been increasing in size; the pain and throbbing have been worse during the last eight months.

Physical signs.—The abdomen is prominent. It is occupied by a globular swelling, which is located chiefly in the left half; the left border of the swelling is felt 5 in. to the left, and the right only 2 in. to the right of the linea alba. Vertically the tumour measures 6 in., and the umbilicus is situated almost midway between its upper and lower borders. Between the lower border of the tumour and the pubes, *i.e.* over an area of 3 vertical in., the percussion note is resonant, whilst over the tumour the note is dull. Both flanks are resonant. The tumour appears to be cystic.

Vaginal examination.—The cervix uteri is rather lower than normal. The body of the uterus is retroverted. No portion of the abdominal tumour can be detected in the pelvis. The temperature is normal.

Operation.—The abdomen was opened by a mesial incision, extending from 2 in. above to 3 in. below the umbilicus. The tumour, which was of a deep blue colour, was tapped, and three pints of fluid—like water slightly tinged with blood—were removed. Immediately the tension exerted by the fluid was relieved, the vessels in the cyst wall became apparent and enlarged greatly. The small bowel was crowded around the base of the cyst, which sprang from the spine a little to the left of the middle line. There was marked puckering of the peritoneum lining the posterior half of the pelvis, and with difficulty both ovaries were eventually found and examined. The sac was stitched to the abdominal wall and drained.

Examination of cyst fluid.—The reaction is intensely alkaline. After boiling for a few seconds, it becomes converted entirely into a mass of jelly, presenting a dirty grey hue. Strong nitric acid poured freely upon this coagulum produces no appreciable change. When the fluid is rendered faintly acid by hydrochloric acid and then boiled, small white flakes appear in abundance, but it no longer coagulates *en masse.* Cold solutions of corrosive sublimate, of alum, and of sulphate of copper, threw down an abundant white precipitate. Nitric acid (strong) threw down a solid deposit, which was not redissolved by excess of acid. When the fluid was boiled with freshly prepared Fehling solution, it assumed a deep violet colour. The fluid contained red blood corpuscles, healthy white blood corpuscles (which were more numerous than could be accounted for by the mere admixture of the fluid with blood), old white blood corpuscles containing fatty granules, a few small collections of old blood pigment and some bacteria and sarcinæ. The tumour had evidently never contained glandular epithelium.

For nearly three weeks after the operation the temperature varied from 100° F. in the morning to 102° F. at night, but eventually this subsided, and the patient made a satisfactory recovery.

CASE 3.—*Encysted hæmorrhagic peritonitis, originating during the puerperal state.*—Mary I., æt. 35, and married six years, has had three children; the last child was born five months ago. She affirms that the abdomen never seemed to go down properly after this confinement, and that it has in fact gradually increased in size since. She has complained but little of abdominal pain.

Physical signs.—The abdomen is very distended. The girth at the umbilical level is 40 in. The percussion note in the midline is dull, from the pubes to 3 in. above the umbilicus. Both flanks are resonant. Fluctuation is readily elicited, and conveys the impression that the tumour is a unilocular cyst containing thin fluid.

Vaginal examination.—The cervix uteri is directed towards the left wall of the pelvis, and the body lies on the right side, the position being one of right lateral version. By pushing firmly, but gently, against the vaginal roof anteriorly, a portion of the abdominal tumour is felt descending into the pelvis.

The temperature is 101°·5 F., and the pulse numbers 105 per minute.

Operation.—The abdominal wall was incised mesially, from a spot situated midway between the umbilicus and pubes to within an inch of the latter anatomical mark. When what appeared to be the peritoneum was exposed, it was impossible to grasp it, as is usual in cases of ordinary ovarian cysts, and when it was incised a thin dark blood-coloured fluid escaped, with some discoloured flakes of lymph. The abdominal opening was extended upwards to the umbilicus. The hand was now introduced into the sac, but as none of the pelvic organs could be differentiated, and no portion of gut could be felt, the abdominal incision was cautiously extended upwards still farther. At the level of 3 in. above the umbilicus the true peritoneal cavity was opened, and it then became apparent that the sac which had contained the hæmorrhagic fluid was an encysted portion of the peritoneum. The omentum, which was greatly thickened, and portions of the small bowel, were incorporated with the upper limiting membrane, and formed practically the upper wall of the sac. The peritoneum was sutured, and, after washing out the sac thoroughly, the abdominal wall was also sutured, an opening being left in the lower portion of the wound to allow of drainage. The hæmorrhagic fluid removed measured nearly 3 quarts.

The temperature fell immediately after the operation, and never thereafter exceeded 99° F.

The patient recovered without an untoward symptom.

Remarks.—I have called this a case of encysted hæmorrhagic peritonitis, because I have been unable to find a better title.

Case 4.—*Tumour formed by matting together of viscera and extravasation of fæces, from ascending colon, in consequence of malignant disease.*—Mrs. B., æt. 56, and married seventeen years, has had three children; the last child was born thirteen years ago. Menstruation ceased three years ago. For twelve months patient has complained of pain in the right iliac region, and during the last four months she has detected at the seat of pain a small lump, which has slowly increased in size. She affirms that she has always suffered a good deal from indigestion, and that the bowels have always been rather confined. There has been no sickness. Since the menopause, three years ago, she has lost flesh.

Physical signs.—The lower half of the right abdomen is slightly prominent, and corresponding with this prominence palpation detects a small saucer-like swelling, with a somewhat free border, which extends horizontally from the anterior superior spine of the ilium to the linea alba, and vertically from the right Poupart's ligament to the level of a spot situated about ½ in. above the umbilicus. It measures vertically and horizontally 4½ in. Over the upper half of the tumour the percussion note (light percussion) is dull, whilst over the lower half it is resonant. The lump is extremely tender.

Vaginal examination.—The uterus is retroverted, but no portion of the abdominal tumour can be felt in the pelvis.

The temperature is normal.

Sickness now rapidly supervened, and the patient died of exhaustion five months after the tumour had been observed by the patient herself, and thirteen months after the first symptom, namely pain, had been noted.

Autopsy.—The tumour, which was adherent to the anterior abdominal wall, was formed by ascending colon, ileum, appendix vermiformis, gall bladder, and a small portion of duodenum. Primary extravasation of fæcal matter had taken place into the cellular tissue behind the ascending colon, and had been for a time confined by the matted structures, and secondary extravasation had occurred into the peritoneal cavity. In the ascending colon, about 1 in. above the ileo-cæcal valve, was a somewhat pultaceous malignant growth of about the size of two walnuts. Immediately above this growth were two small perforations, by which fæcal matter had been extravasated from the ascending colon.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

Prehistoric Problems. By Robert Munro, M.A., M.D., F.R.S.E. Edinburgh and London: William Blackwood & Sons. 1897.

No one who has given a thought to the evolution of man could fail to be interested in what Dr. Munro has to say on this subject. The various problems which he deals with are presented in a most readable form, and touch upon many of the points which are at present engaging the attention of the anthropologist. The book is divided into two parts, namely, anthropological and archæological. Each chapter is more or less complete in itself, dealing with a special subject, and in most cases showing little or no sequence with that which precedes it; but this in no way detracts from the interest or value of the book, and by the general reader may even be considered as an advantage. Instead of being presented with one large canvas on which is depicted one elaborated subject, we are given a series of small and separate sketches, in which are portrayed the characters and mode of life of certain of the prehistoric inhabitants of Europe. In one we have a view of a fishing expedition setting out, it may be from one of these lake-dwellings upon which Dr. Munro is so great an authority, armed with deer-horn harpoons of various designs; in another we are given a glimpse of our early progenitors disporting themselves on the ice on rude skates, made of the metacarpal bones of a horse; or it may be of an early agriculturist, laboriously gathering in his meagre harvest by means of a minute stone or bronze sickle; or of a trapper sauntering along the river bank and setting traps of very ingenious design for the capture of the beaver or the otter. Not the least interesting of this series of prehistoric sketches is one in which we are introduced to the early surgeon, patiently scraping a hole in the cranial wall of an epileptic girl, with the view, no doubt, of affording the evil spirit a means of escape, and thereby foreshadowing the brilliant results of modern cranio-cerebral surgery.

In an address delivered in 1893 at the Nottingham meeting of the British Association, Dr. Munro dwelt upon the great step in human evolution which was attained when man assumed the erect posture. He argued that this attitude of body was a necessary preliminary to the increased development of the brain and the expansion of the cranium. The arms, set free from the menial office of conveying the body from place to place, became the servants of the mind, and with so great a mutual advantage that the ultimate result is a "human hand" and a "human brain." This address is reprinted in full in the present volume, and the theory is further elaborated and more strongly advanced. As originally stated, Dr. Munro's views are not only reasonable but in many respects convincing; but now he pushes the matter further, and separates the two evolutionary phases of the assumption of the erect attitude and of the brain development by too great a gap. Instead of allowing these two changes to go on to a large extent concurrently, he presents us with a finished lower limb, long before the cranium has divested itself of its simian characters. He accepts *in toto* Dr. Dubois' views in regard to the so-called *Pithecanthropus erectus*, and fashions these into one of the main pillars of support of his theory. A most grotesque progenitor is thus presented to our eye, with lower limbs as long and as strong as those of the present day, shaped and moulded upon lines identical with those of a modern civilised man; and upon the shoulders of this individual he places a simian head. Such a being could only be compared with some of the mythological monstrosities of the ancients—with this exception, that the ancients were generally in the habit of dignifying the upper part of the body and degrading the lower part.

The remains out of which Dr. Dubois has created a new family (*P. erectus*) were discovered in Java in 1891–1892. They consist of a calvaria, two molar teeth, and a femur. They were all found under the same geological conditions, but not at the same time, nor did they lie together. The femur was placed at a distance of 15 metres from the calvaria.

The publication of Dr. Dubois' memoir on these remains was immediately followed by keen criticism in almost every part of the scientific world. Views of apparently the most diverse kind were expressed, and Dr. Dubois has arranged his critics in three classes, namely—(1) Those who consider the cranium to be that of an ape; (2) those who think that it represents an intermediate link in the human evolutionary chain; and (3) those who are of opinion that it is simply a human skull of a very low grade. Dr. Munro is rather inclined to be sarcastic over what he considers to be the very opposite views entertained regarding the Java cranium, but a good deal of this discrepancy of opinion may be accounted for by the very different interpretations which different writers give to the word "human." In its relation to structure it is a very vague and ambiguous word, and it is not only difficult but well-nigh impossible to appreciate the precise value which different writers give to it. We speak of a "human line of descent." I presume that by this we refer to the hypothetical line in the genealogical tree, which extends from the point at which the last simian offshoot has taken place up to its terminal end, which is represented by civilised man. At the mid-point of this line we would have a progenitor with simian and human characters more or less equally balanced; as we proceed towards the terminal end, human characters would gradually gain the ascendancy; but as we pass in the opposite direction, to the place where this line joins the common stem, the ape characters would increase and the human characters gradually decrease, until, indeed, they would finally reach a vanishing point. Although Dr. Dubois has classified his critics into the three categories indicated above, and Dr. Munro follows him in this respect, it is very apparent that this is a most unfair and a most unsatisfactory manner of representing the true state of affairs. It is more than likely that all who have written on this subject would be at one in giving a place to the so-called *P. erectus* (judged from the cranium alone), at some point on the hypothetical line of human descent, and it is quite conceivable that some of these writers might even apply the term "human" to every primitive form represented upon that line. Of course the natural course to pursue would be to bisect the line and restrict the term "human" to those of our progenitors who lie above this point. At whatever point on the line we place the Java specimen, it must be regarded as an intermediate form; but its characters all point to its occupying a place very much nearer the bottom than the top of the human line of descent. The simian characters predominate, and, with the single exception of its great capacity, it presents no other marked human feature.

The discrepancy of opinion regarding the Java cranium is also in part due to the fact that the earlier critics had only Dr. Dubois' original memoir before them when they expressed their views on the subject, whilst the later critics had the advantage of handling the specimen itself. The original description was admirable in every way. It showed great erudition on the part of the author; and yet, some way or other, it failed to bring out in their full strength some of the more striking simian characters of the cranium. Two of the earlier critics (Petit and the present reviewer) have therefore somewhat modified their views, and now give the specimen a much lower level than they were inclined to do at first.

The femur is unquestionably a human bone; not only so, but in almost every feature it resembles the femur of a modern civilised man. It presents none of those characters which we are in the habit of associating with the femur of savage races, and still less any of those features which we have some reason to believe were peculiar to the femur of the early prehistoric races. It shows not a trace of those marks which distinguish the femora of races who assume while resting the squatting attitude. From such a bone we can readily reconstruct the lower limb to which it belonged. Its articular surfaces, its neck, its shaft, all bespeak a limb in every respect similar to that of a modern European; and, further, a limb not particularly muscular and somewhat feminine in its build. Such is the femur that Dr. Dubois and Dr. Munro would have us associate with the simian skull.

No doubt, by dissociating the femur from the cranium, we are landed in a dilemma which in the present state of our knowledge it seems impossible to overcome. The two specimens were found in the same alluvial bed and under precisely the same conditions. It would almost seem as if they were deposited there by the same flood. The evidence afforded by Dr. Dubois on this point is most precise, and, assuming that he has not been misled, it is difficult to arrive at any other conclusion than that the cranium and the femur possess the same degree of antiquity. How, then, can we account for a femur so modern in its pattern existing at a period long antecedent to that to which the famous remains of Spy belong? It is impossible to answer this question, but further investigations in the same geological beds may ultimately afford a solution of this problem. Dr. Dubois was keenly alive to this difficulty. This is shown by the strenuous efforts he has made to fit the two specimens together. In the cranium he tries to detect characters which would suit it for the erect posture, and in the femur he thinks he sees certain features which indicate that the individual that possessed it had not lost all his arboreal tendencies. One point is certain, namely, that the interest attached to the cranium is in no way touched by any conclusion that may be arrived at in regard to its antiquity. No matter what its age may be, it constitutes a distinct link in the evolutionary chain of man—the most important link, indeed, which has yet been discovered.

D. J. Cunningham.

Outlines of Practical Surgery. By Walter G. Spencer, M.B., M.S., F.R.C.S. London: Baillière, Tindall & Cox. 1898.

We learn from the preface that the author has limited his book to practical subjects, and that details of pathology and bacteriology have been intentionally omitted. An attempt has been made to bring together, in one handy volume, the principles, and to a considerable extent also the details, of treatment applicable to the various surgical affections considered regionally.

The work is divided into two parts. Part I.—about a quarter of the book—is devoted to the practical details of general surgery. The opening chapters dealing with wound treatment, anæsthesia, and with general questions connected with surgical operations, are on much the same lines as those to be found in books upon minor surgery and bandaging. The latter subject, however, is too briefly treated to be of much practical value to the student; and the same remark applies to ulcers and their treatment.

The author prefers an antiseptic treatment of wounds, but takes the wise precaution to wash away all superfluous antiseptic with a simple aseptic fluid. Carbolic acid and permanganate of potash are the two antiseptics which find most favour. We do not think that many surgeons will be satisfied with the means advocated for the sterilisation of instruments and silk. The remaining chapters of Part I. are occupied with the practical surgery of the vessels, nerves, skin, and mucous surfaces, the muscles, bones, and joints. The various intestinal sutures are well described and clearly illustrated.

Part II. deals with the regional surgery of the head and neck, the chest, abdomen, and pelvis, the extremities, and the spine. What pathology is introduced in these sections is well up to date and sufficient to lead the student up to appreciate the principles of treatment, which have been laid down with admirable clearness and judgment.

Almost every possible lesion of the various regions has received its due share of attention; and the practitioner will be glad to find that due regard has been paid to all the minor surgical affections. Considering that the regional plan has been rigidly adhered to, there is wonderfully little repetition.

In a work so essentially practical, there will of necessity be found methods which are open to criticism. In removing the vermiform appendix, we fail to appreciate either the advantage or the necessity of stitching the stump to the parietal peritoneum before amputating the organ. In arresting hæmorrhage from a puncture in a large vein, we think it wiser, at any rate in the neck, to double ligature the vessel rather than trust to a lateral ligature.

An amputation at the ankle, with an incision carried round the "point of the heel," should not be described as "Syme's operation." Unless it be pointed out that such an operation is the author's modification of the classical operation, a misunderstanding is liable to arise between the student and examiner, for which the former is not to blame.

Considering the limited size of the volume, noteworthy omissions are singularly few. A distinction might with advantage be made between fractures of the clavicle internal to the coraco-clavicular ligament and those which are at or external to it, and also between fractures of the anatomical and surgical neck of the humerus. We do not find any mention of Lorenz's valuable method of treating congenital dislocations of the hip in young children.

In the paragraph dealing with spreading traumatic gangrene, we think some reference should have been made to malignant œdema.

The figures—black on white—although purely diagrammatic, and having no pretence to artistic merit, will nevertheless prove decidedly helpful to the student as well as useful for black-board illustration. Some of them—notably those intended to show lines of incisions—have been rendered unnecessarily complicated and tedious of interpretation, in consequence of the number of reference lines which traverse them.

Mr. Spencer's work can hardly take the place of the ordinary text-books that are recommended to students attending a systematic course of lectures on surgery; but the author is to be congratulated on having filled a decided want. We know of no book so well calculated to prove helpful to the student who is working at clinical surgery. We have every confidence in recommending it as a valuable and reliable *vade mecum* for use in the surgical ward. Its eminently practical character should make it of real use to the practitioner. The book, written in language at once clear and concise, gives the reader the impression that the author is an able and experienced teacher.

HAROLD J. STILES.

Materia Medica, Pharmacy, Pharmacology, and Therapeutics. By W. HALE WHITE, M.D., F.R.C.P. Third Edition. London: J. & A. Churchill. 1898.

OWING to the race for early publication of popular handbooks on Materia Medica, as adapted to the altered British Pharmacopœia, it is not a surprising thing to find that the latest editions exhibit evidences of haste, and signs which show the necessity for future revision at leisure. The volume under review is no exception. Dr. Hale White's book requires no recommendation at our hands as to its general arrangement, or its form of expression, save in one particular point, noted below. In this edition the proof-reading has, of course, been hasty and therefore inadequate. Thus on page 11, for example, we find Aconita for Aconitina, and every here and there minor misprints crop up. These, however, will soon, in all probability, be corrected, but it would have been wiser, perhaps, to have delayed publication of the new edition until the commencement of the winter classes, in the hope that such errors might have been avoided, even at the cost of being preceded by competing text-books. The classification of the actual Materia Medica substances, their descriptions, and the explanatory text, are the most logical of any of the text-books of this class on the subject. A little more detail in the section devoted to pharmacy would be a great help to students, and prevent the necessary purchase of other books for the fuller information required, while the part dealing with prescription writing is not nearly so full as the importance of that too slighted subject demands. We have searched in vain for any advice as to the two ways in which pills or powders may be prescribed, or for any list of Latin equivalents for fractions, should such be required for use in the extended prescription demanded of students in examinations. Such additions would make the volume an ideal one. A. LOCKHART GILLESPIE.

Outlines of Medical Jurisprudence for India. By J. D. B. GRIBBLE, M.C.S., and PATRICK HEHIR, M.D., F.R.C.S.Ed. Fourth Edition. Madras: Higginbotham & Co. 1898.

THE preface states that "this book is intended to provide the non-medical reader, in an intelligible form, with such matter as is contained in the more comprehensive and technical works on Indian medical jurisprudence, such as those of Chevers and Lyons—free from all that might otherwise be complex." And again, that "the book has been adapted to the requirements, not only of the subordinate grades of the medical service, but likewise of police-officers, subordinates of the judicial service, and pleaders."

The adaptation for the above purpose appears to consist in the provision of footnotes explaining anatomical terms, *e.g.*, "Ossification is the process by which bone is formed," etc.; but it is difficult to understand what advantage there can be in thus adapting medical jurisprudence for the lay reader, and what the requirements of police-officers can be in the subject. "A little knowledge is a dangerous thing"; and this is most apt to be so when the knowledge is medical jurisprudence, and its object the detection of crime.

We notice, however, that the book has been adopted by the Government of Madras as a text-book on medical jurisprudence. Since this is so, it is to be hoped that the student will extend his reading beyond the limits of this volume, if he desires to acquire a sound knowledge of the subject.

The book no doubt contains some interesting illustrative cases, and an account of certain forms of crime which are practically unknown in this country; but as a text-book on the general facts of medical jurisprudence, it cannot be compared with those commonly in use in this country; and while it may possibly fulfil some useful object in the educational training of certain officials in India—as, indeed, the fact of its already having passed through three editions would seem to indicate

—yet it is difficult to understand what advantages it can offer to the student, so long as other well-known text-books are available.

HARVEY LITTLEJOHN.

[illegible] *Nose, Pharynx, and* [illegible] M.D.Lond., Physician in [illegible] Royal Infirmary. Third [illegible] 1898.

[illegible] was sold out within a few [illegible] edition of a thousand [illegible] is sufficient to indicate [illegible] words of the author in his [illegible] work, which has been [illegible] upon the advances made [illegible] to the study of diseases [illegible] serves its purpose. Much [illegible] reader being called upon to [illegible] methods of conducting an [illegible] the objects to be observed, [illegible] free from unnecessary [illegible] means of studying disease [illegible] the importance of taking [illegible] dition, and of investigating [illegible] Even when purely local [illegible] should not be neglected. [illegible] formulæ are appended. [illegible] that the third edition will [illegible] editions have done.

A. LOGAN TURNER.

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its rightful owner, and, as might be expected, shows a wonderfully extensive acquaintance with the literature of heart disease.

The work begins with an interesting account of the clinical features and diagnostic indications of heart disease. To this section succeeds a most suggestive portion of the book, devoted to the neuro-muscular and hæmic factors in their bearing upon prognosis and treatment. To the elucidation of the many problems of the circulation in health and disease the author brings a vast array of physiological and pathological observations. Among the numerous subjects considered in this section is the state of the blood in cyanosis. The author does not agree with the present writer in regarding the increase of hæmocytes and hæmoglobin as compensatory. It is, as he says, an interesting subject, and, it may be added, it is one that might be definitely settled by comparison of the arterial and venous blood in a few suitable cases. The third part of the book is devoted to the principles of treatment. It deals with general considerations on the management of the neural, muscular, pulmonic, and hæmic factors, and is marked at once by originality of view and ingenuity of thought.

This is followed by a thorough and exhaustive description of the uses of baths and exercises, forming the fourth and longest part of the work. It is devoted to those methods of treatment which have during the last few years been so much under debate. The author approaches the subject from the physiological side, and, after a brief historical glance at the results of Beneke, Groedel, and the Schotts, describes the effects produced by natural and artificial baths of the type found at Nauheim. "Facts are more eloquent than comment," says the author, and in accordance with this view he brings before the reader a long series of observations both at the celebrated spa and in this country. From these he is led to the conclusion that the action of the baths lies partly in their stimulant effect on the skin, partly in the alternating exertion and repose involved in the act of bathing. From my own investigations both at Nauheim and by means of artificial baths at home, this opinion seems to be most reasonable. The author's remarks on the resistance-exercises form the most important observations on the subject in our language; in this part he fully analyses them and their effects in a masterly fashion. In this portion of the work, as in that on baths, he does not write like an enthusiast, but like a man of logical mind and scientific training. He is, like most of us, sceptical as to diminution of the size of the heart, and regards change of position as the more likely explanation of altered percussion. The book ends with an interesting appendix by Groedel on the uses of baths and gymnastics.

The work as a whole is of the greatest value to all who desire to have a calm and dispassionate exposition of a very difficult subject, as well as full practical details on the modern methods with which it is concerned, and the author has conferred a great benefit on the medical profession by his labours. G. A. Gibson.

Medical Diseases of Infancy and Childhood. By Dawson Williams, M.D. London: Cassell & Co. 1898.

Notwithstanding the large amount of literature now existing on the diseases of children, a want has been felt for a small handy volume, which would serve as a guide to the student and junior practitioner. Dr. Dawson Williams' book, we think, is one which will supply this want, and this, the author states in the preface, is his object in giving

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organism within the body, and with an examination into the tissue changes which it or its toxins effect. No work has yet appeared which deals so minutely with these questions as this of Babes. With painstaking labour he has sought for the parasite in all its haunts, and has, from the employment of new modes of staining and the use of high powers, thrown fresh light on its situation. Thus he has demonstrated that it may exist within as well as outside cells, and that Unna's red and blue varieties are occasioned by decolorisation and contrast staining. The relationship with the tubercle bacillus is a close one, and the suggestion is thrown out that possibly the bacillus of bird tuberculosis may be a transition form between the two. He has also been able to prepare from leprous material a substance like tuberculin, having a similar action on leprous persons as that has on tubercular. He accounts in part for the difficulty of cultivation, by furnishing some proof that a large number of the bacilli are either in a dead or at least in an inactive condition in the tissues, though some preserve their vitality throughout long periods. After a detailed description of the bacillary relation to the principal organs of the body, a series of pertinent questions are formulated, embracing most of the disputed points connected with the leprosy problem, and in the answers the deductions from his personal observations are most clearly stated. The numerous excellent illustrations enable one to follow the statements made in the text very readily, and the book will be for a long time the recognised work of reference on the subject.

W. Allan Jamieson.

Die Arbeit der Verdauungsdrüsen. Vorlesungen von Prof. J. P. Pawlow, St. Petersburg. German translation by Dr. A. Walther of St. Petersburg. Wiesbaden: J. F. Bergmann. 1898.

One of the distinguishing marks of the Russian scientist appears to be the extended horizon bounding his appreciation of his subject. His views are philosophically distant; his conclusions are not apt to be based upon a horde of minor points, to be filled in with innumerable petty details, or to be so conceived that the chief figure is indefinite and aimless from the multiplicity of his premises. The patient accumulator of facts renders service to science; the broader mind marshals them; the inventive discovers or predicates the path for the others to tread.

The Russian mind seems to belong to the second category.

The work of the Slav nations is unfortunately hidden from the larger part of the world when published in the vernacular; even the advantages which might accrue from an ability to peruse the original would probably fail to counterbalance the load, mental and physical, inseparable from the acquirement of the language.

A translation of Pawlow's lectures, in the work engaged upon by the various glands concerned with digestion, is most welcome.

The volume is composed of eight lectures. *Seriatim*, the theories at present current, and the established facts as to the *rôle* of the glands of the digestive system; the methods on which these are based, or by which they have been proved; the active work of the glands during digestion; the centrifugal nerves of the stomach and pancreas; the system of innervation in general; the relation between psychical impulses and secretion; the chemical excitants of secretion; and, lastly, the influence of physiological science and the laws of instinct upon the treatment of disease, are dealt with.

The author bases his conclusions upon literature already extant, and upon the work of those who for several years have investigated many of the intricate problems of digestive physiology in his laboratory. He commences by postulating that the digestive organs constitute what practically is a chemical factory, in which the food is treated in such a manner that the products can be disposed of in the local market of the host at the lowest price, and be sold there (or used up) at their highest value. The work is performed under the guidance of local foremen, as well as under the superintendence of a general manager.

Details of the different methods of forming fistulæ in the living animal follow, of value to practical investigators as the outcome of a vast experience. The second lecture may be summed up in the following statements:—Secretion commences when food is taken, the amounts being directly proportionate. The secretions of the different glands vary in volume and properties with the time after the taking of food, the nature of the food, and the health of the individual. In health, the variations in the amount, acidity, activity, etc., correspond with extraordinary exactness to the amount of work required. The greater the stimulus, the more the secretion; the more the secretion, the greater the amount of acid or alkali poured out; although, be it noted, the actual reaction of the secreted fluid does not vary. The gastric juice obtained from a completely isolated portion of the stomach is rapidly secreted up to the end of the second hour if meat alone be taken, then diminishes; after bread, a still more rapid rise takes place, but only for one hour, the maximum amount, however, is lower than that of the preceding at a later period; then a rapid fall occurs up to the third hour, followed by a slower final diminution than after meat. Milk causes only a comparatively tardy increase, reaching its height in four hours, and disappearing at the seventh hour. (The data given for the rate of secretion correspond very closely to those for the acidities, etc., in a series of similar experiments in man, published by the reviewer in this Journal in [illegible].) The rate of the pancreatic secretion is markedly hastened by meat up to the end of the second hour, still more so by bread up to the same time, but only very slightly by milk, with a maximum at the fourth hour after ingestion. It follows, therefore, that while bread excites rapid secretion of gastric juice, it causes coincidently an increased flow of pancreatic juice, the increase of the gastric juice being of short duration, corresponding with the proportion of proteid in the bread, the pancreatic [illegible] the large amount of other constituents propelled into the duodenum undigested. Meat alone requires pancreatic assistance, but milk, remaining long enough in the stomach, calls for little [illegible] by the pancreas, except to split up the fat, the rise in the pancreatic secretion occurring later and in smaller quantity, as much less suffices for the purpose.

[illegible] each, flesh induces most flow of juice, equal quantities of [illegible] less, and of milk least; the flow, as equivalent to the nitrogen present, is most with bread, least with flesh. As the secretion analysed was procured from a portion of the stomach not actually engaged in active digestion of the food, the variations in proteolytic power are of interest. The secretion induced by the taking of bread possesses the highest peptic action, that after flesh a power much below it, followed at no great distance by the secretion after milk has been taken. Pawlow unaccountably overlooks the effect of the proportion of proteid in the food upon the secretory mechanism, and on the activity of the acid in the gastric contents.

The main object of the author has been to indicate and corroborate by investigation the different theories as to the nervous mechanism of digestion, as adumbrated by other observers. Is it too much to hope that some time or other an English translation of some of the work of Russian scientists may be published in this country or in America?

A. Lockhart Gillespie.

Laboratory Work in Physiological Chemistry. By Frederick G. Novy, Sc.D., M.D., Junior Professor of Hygiene and Physiological Chemistry, University of Michigan. Ann Arbor: G. Wahr. 1898.

This book, although now in its second edition, is practically unknown to British readers. Up to the present, anyone wishing to find out how a particular analytical method in physiological chemistry ought to be carried out, had of necessity to refer to a German text-book. This comparatively small book, for it only covers some three hundred pages, gives as good a general account of ordinary laboratory methods as any teacher or student could desire. Although the author refers in his preface to help derived from the works of Salkowski, Hammarsten, and others, it is but fair to say that the book has undoubtedly been written by one who has worked out the methods and knows the importance of exact practical details.

In the first three chapters he discusses the fats, carbohydrates and proteids, describing their general characters, modes of separation, tests, etc. There are, of course, some statements with which all will not agree; for example, excess of sodium chloride is usually regarded, not as an advantage, but a hindrance in the potassium ferrocyanide test for albumoses. The table giving a classification of proteins (as the author terms them) is not a good one, some bodies appearing under separate headings which ought to have been put together, and *vice versâ*. It is difficult to understand why paracasein (casein) is to be regarded as a simple albuminous substance, while caseinogen is a complex one. Here, as on many other occasions, the author follows German nomenclature, speaking of casein when caseinogen is meant, and paracasein for casein. The inclusion of albumoses and peptones among albuminoids is not to be recommended.

Succeeding chapters deal with the secretions and excretions, and a short section is devoted to the blood. Quantitative analytical methods are described in the second last chapter as fully as the space at the author's disposal permitted. The Krüger-Wulff method for the estimation of the alloxur bases should hardly have been described without referring to the fact that other nitrogen-holding substances are precipitated, and the results obtained are therefore too high. T. H. Milroy.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Clinical Tests, Methods, and Signs—*continued.*

The Stomach—*continued.*

Winkler has found (*Centralbl. f. innere Med.*, Leipzig, 1897, Bd. xviii. S. 39) that alphanaphthol gives a sharp, well-defined reaction with free hydrochloric acid, while organic acids do not affect it. If one or two drops of a 5 per cent. solution of alphanaphthol in alcohol (or 10 per cent. in chloroform) be added in a porcelain basin to a small quantity of stomach contents, into which a few grains of dextrose have been introduced, and the whole carefully heated to dryness, a fugitive blue-violet colour appears round the edge, quickly becoming of a much darker hue. The sugar may be dissolved beforehand in the naphthol solution.

Von Mering (*Verhandl. d. XV. Cong. f. innere Med.*, Wiesbaden, 1897) believes that he can determine the absorptive power of the stomach by introducing into that organ fluids containing two substances, the one easily absorbed, the other only with difficulty, such as dextrose and yolk of egg. If a healthy man be given on an empty stomach 250 c.c. of yolk of egg emulsion, containing 29 per cent. of grape-sugar and 8 per cent. of fat, after two and a half hours about 125 c.c. should be recoverable, with 5·1 per cent. of sugar and 1·65 per cent. of fat. Variations in the relations between the two substances indicate abnormal conditions of absorption.

Arnold (*Journ. Am. Med. Assoc.*, Chicago, 1898, vol. viii. p. 21) gives a new test for the detection of lactic acid in the stomach contents.

1. 0·2 c.c. saturated alcoholic solution of gentian-violet in 500 c.c. of distilled water.

2. Tinctura ferri perchloridi (*U. S. Pharm.*, 1890), 5 c.c.; distilled water, 20 c.c.

A drop of Solution 2, added to 1 c.c. of Solution 1 in a porcelain basin, gives a blue colour, which changes to a green or yellow-green on the addition of a few drops of filtered stomach contents, should lactic acid be present.

Jager (*Centralbl. f. d. med. Wissensch.*, Berlin, 18th June 1898) recommends a modification of the Morner-Sjöqvist method for estimating free hydrochloric acid, with the view of avoiding the fallacy inherent in this method, owing to the presence of phosphates. He makes use of the precipitation of casein in diluted cow's milk, by the free hydrochloric acid in the stomach's contents, the only constituent able to separate it from dilute milk at the ordinary temperature. To 10 c.c. of milk diluted with 50 c.c. of water, decinormal hydrochloric acid is added, until precipitation of casein appears. The amount of acid necessary is easily estimated. After removing the organic acids from a sample of stomach contents, by shaking with ether, the amount of free hydrochloric acid can be estimated by the quantity required to precipitate the casein in 10 c.c. of milk. Directions are also given whereby the disturbance caused by the presence of phosphates can be allowed for.

Kirikow (*Centralbl. f. d. med. Wissensch.*, Berlin, 20th August 1898) gives the following results of an investigation into the effect of hypertrophic cirrhosis of the liver upon the reactions of the stomach contents:—

(1) The total acidity is diminished; (2) the total proportion of hydrochloric acid is lessened; (3) free hydrochloric acid is much diminished, or is absent; (4) the digestive power of the stomach is weakened; (5) rennet acts slowly; (6) organic acids are only present in traces; (7) erythro-dextrin, from the digestion of starch, is often abundant; (8) absorption is delayed; (9) motility is unimpaired; (10) the appetite is good or increased; no symptoms of dyspepsia are present. In diabetic patients the gastric contents were normal in their properties, or slightly hyperacid, and of greater digestive power.

Cannon (*Journ. Boston Soc. Med. Sc.*, February 1898) contributes a most interesting study, excellently illustrated, of the movements of the stomach walls, by means of the Röntgen rays. The paper must be consulted in the original for a proper appreciation of its contents.

Schneider (*Virchow's Archiv*, Bd. cxlviii. S. 1, 2) lays down from observation that—

1. The reaction of the stomach contents varies much more readily than the power of absorption, in all diseases of the stomach and other organs.

2. Excepting in neurotic conditions, no specific influence can be predicated of any disease upon the acidity and rate of absorption of the stomach contents.

3. Consideration of all the circumstances in each particular instance, and of their relationship to the symptoms and to each other, is absolutely necessary, to render the results obtained from the estimation of the gastric properties of any value.

Achylia Gastrica.

On this subject, Gerhardt (*Berl. klin. Wchnschr.*, 29th August 1898) first discusses the nature of the condition, termed by Ewald, in 1886, anadenia gastrica; by Einhorn, in 1892, achylia gastrica, or absence of gastric secretion. At first it was thought that this absence of gastric juice was due to atrophy of the gland cells, but Einhorn showed postmortem that this was not the case. Martin, in fifteen cases of this disease, found only a small number to be suffering from pernicious anæmia, which it frequently accompanies; the majority were either neurasthenics, or had suffered for long from gastric troubles. In two of the anæmic cases complete atrophy of the stomach cells was found post-mortem; small pieces of the gastric mucous membrane removed from patients of the second class during life contained glands in an almost normal state. Lubarsch, however, on more minute investigation of the pieces of mucous membrane removed, found them always to be in a more or less advanced state of atrophy, and so throws doubt on Einhorn's opinion that the symptoms of achylia gastrica are of true nervous origin.

Gerhardt gives details of two cases of simple achylia. In the first, a man of 49 years, who had suffered from a feeling of weight in the stomach and vomiting for four weeks, the fæces were full of undigested fat, the stomach contents possessed no digestive power, but the stomach motility was unimpaired. The fæces soon became normal in appearance, and all the symptoms disappeared in a month. The presence of fat in the stools pointed to pancreatic or intestinal derangement, in addition to the gastric achylia. It is difficult, he says, to say whether the symptoms were all due to nervous causes, or were caused by some organic lesion undiscovered.

The second case, a man 32 years of age, had suffered for three years from vomiting and gastric pains. The stomach contents were alkaline, or faintly acid in reaction, and contained neither pepsin or pepsinogen, nor excess of bacteria. The stomach was empty as soon as three-quarters of an hour after the test-breakfast. Special facilities were offered by this patient for the determination as to whether the symptoms were entirely dependent upon alterations of the gastric mucous membrane or not. Secretion of gastric juice was found to be absolutely wanting; although the liver, pancreas, salivary glands, and intestines seemed to act normally, the motility of the stomach was unimpaired, and its power of absorption, tested as v. Mering recommends (see above), unaltered. Unlike its power in health, this patient's urine was unable to digest fibrin on the addition of acid; there was no pepsin in it. Digestive leucocytosis persisted. Little loss of power in actual digestion was caused by the condition; raw meat, however, was hardly made any use of. Light diet, preferably fluid, and never in tough, compact lumps, is indicated, and scarcely requires any medicinal addition, as the bowel is able to do all that is necessary.

Reichmann's Disease.

Continued hypersecretion of hydrochloric acid, as first described by Reichmann, is, according to Roux (*Gaz. d. hôp.*, Paris, 1897, No. 61), almost always due to some pyloric or subpyloric organic stenosis, more or less complete, leading to irritability of the gastric mucous membrane, and consequent hyperacidity. The disease may be temporary or permanent in character, and range from merely simple to absolutely continuous excretion of hyperacid juice. Stasis of the gastric contents is an important factor in its causation; removal of this condition the most important indication for medicinal or surgical treatment.

Gintl (*München. med. Wchnschr.*, 1897, No. 23) corroborates the preceding. The presence of acid contents in the fasting stomach follows increased irritability of the gastric mucous membrane. Chronic continuous secretion denotes some disturbance between the stimulating cause and the effect. Cases certainly do occur in which continuous secretion is a primary condition, not a secondary symptom only.

Carli and Fantino ("Les sténoses pyloriques, etc.," referred to *Arch. f. Verdauungskrankh.*, Berlin, 1898, Bd. iv. Heft 1,) found in forty-one patients operated on for non-malignant stenosis of the pylorus (in nine contracture of the orifice was found, in the rest the stenosis was thought to be due to spasm), a greater or less degree of hyperacidity. They are inclined to regard the spasmodic contraction of the pylorus as primary, irritation from the retained contents calling forth a secretion of hyperacid juice. They do not think that Reichmann's symptom-complex is ever developed except after the occurrence of pyloric stenosis.

Carli and Fantino (*Semaine méd.*, Paris, July 1897) concluded, from the results obtained by them in forty-one cases of pyloric obstruction of benign origin, that Reichmann's disease is not an entity, but that it depends upon contracture of the pyloric orifice, often a functional spasm, caused by irritation, followed by hyperacidity. Retention of the food in the stomach may arise from obstruction at the pyloric orifice, from weakness of the gastric walls, or from continuous spasmodic contracture of the pyloric muscular sphincter.

Dilatation of the Stomach.

Chauffard (*Gaz. d. hôp.*, Paris, 22nd July 1897) gives the notes of a patient in whom an enormous dilatation of the stomach was diagnosed by intragastric trans-illumination, a clinical method also known by the name of gastro-diaphany. The patient, male, æt. 30, of diminutive stature, had been ill nearly a year, presented neither signs nor history of specific disease, alcohol or nicotine poisoning. At first he suffered from slow, brooding pains, occasional vomiting, and flatulence, but not from hæmatemesis. He lost flesh. Later, pyrosis, regurgitation of food, vomiting without effort six hours after meals, chiefly of a bitter fluid, in large quantity, with little of the food previously taken in it; and constipation occurred, although his appetite was normal. Still later, despite lavage, these symptoms became more pronounced, and he continued to lose weight. On his appearance before Chauffard, peristaltic movements of the gastric muscles could be seen on stripping him and laying him on a couch, the stomach contents not being removed; movements proceeding from the cardia to the pylorus and initiated by manual palpation. The empty stomach did not show these movements. Although pressure gave rise to pain over the pyloric region, no tumour could by determined. Fifteen hours after food, the stomach contents, about 1500 c.c., were strongly acid, with free hydrochloric markedly present, traces of lactic and butyric acids, peptones, and some albumin, still unaltered by digestion. Ten hours on one occasion, and fourteen and a half hours on another, after lavage of the stomach and abstinence from food, 250 and 500 c.c. of fluid respectively were drawn off. The light of an electric lamp introduced into the cavity of the stomach, with the patient placed in a darkened room, revealed the cardiac and pyloric orifices in normal position, the lesser curvature descending to just above the umbilicus, the greater curvature reaching to the level of the pubis; the non-existence of any tumour or pyloric thickening; and the fact that the stomach walls were thinner and more transparent than usual. The diagnostic superiority of the gastro-diaphanoscope over distension of the stomach with gas or radioscopy, was marked.

SURGERY.

UNDER THE CHARGE OF

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The Abdomino-Perineal Operation in Cancer of the Rectum.

M. Quénu of Paris would restrict the operative methods to be employed in cancer of the rectum, to the perineal for those low down (within 8–10 cms. of the anus), and the abdomino-perineal for all others. Against the latter, two objections have been raised—first, the persistence of an artificial anus in the iliac fossa (in the view of the author, this is amply compensated for by the greater certainty of radical cure); and, secondly, the gravity of the operation proposed. M. Quénu maintains that, if asepsis be maintained, and the loss of blood reduced to a minimum, there is really no serious risk to life. A preliminary sigmoidostomy is carried out some days beforehand. The belly is opened in the middle line, and both internal iliac arteries are ligatured. The already existing sigmoid anus is liberated, and the bowel is completely cut across with the thermo-cautery. The cut ends are cleansed and enveloped in iodoform gauze. The upper end is then brought out in the left iliac region, and constitutes the permanent anus. The lower end is freed by dividing the mesosigmoid and mesorectum along the entire length of the hollow of the sacrum. It is then packed with gauze at the lower part of the pelvis. The abdominal wound is closed. The patient is then placed in the lithotomy position, and the final steps of the operation are carried out from the perineum. After plugging the anal canal, semilunar incisions are made on either side of the anus, the levatores ani are divided, the anterior wall of the rectum is carefully liberated, the pouch of Douglas is opened, the remaining connections are divided, and the diseased segment of bowel (along with the gauze stuffing in the pelvis) is brought out of the wound and removed. It two cases in which the author carried out the above operation successfully, "there was not the slightest shock"—a fact which was corroborated by M. Nélaton, who was present.—*Rev. de chir.*, Paris, 10th August 1898.

An Inoperable Angio-Sarcoma Cured by Electrolysis.

Dr. Paul Videbech of Copenhagen has waited more than three years before recording this case as cured. The patient, a girl of 16, presented a tumour of the neck as large as a child's head, which had only been observed for two months. It had not caused any pain, nor was it tender on pressure. It was regarded as a lipoma. On the 13th September 1894 an attempt was made to excise it. The greater part of it was removed in fragments; the deeper portions, which infiltrated the muscles of the neck and extended still more deeply between the transverse processes of the vertebræ, were left behind. The wound was swabbed with chloride of zinc, and stuffed with gauze. Microscopic examination of the portion removed showed the structure of an angiosarcoma. On the sixth day, the remains of the tumour were attacked by electrolysis. Four needles, connected with both poles of the battery, were driven into its substance in all directions; the current employed was one of 500 milliampères. This was followed by the sloughing of the tumour in large pieces, some of them as large as a hen's egg; the wound became clean, and promised to heal. By the 13th October recurrence had taken place, so the electrolysis was renewed, without an anæsthetic, on four successive days. No pain was complained of. Extensive sloughing followed; the wound filled up with healthy granulations, and healed by the 1st of November. The patient was seen again in April 1898, and presented the appearance of perfect health, without a trace of recurrence. The author believes that the success of the electrolytic destruction of the tumour in this case is largely due to the fact that the tumour tissue was exposed in an open wound, thereby rendering the application of the needles more efficient, and facilitating the separation of the necrosed tissue.—*Centralbl. f. Chir.*, Leipzig, 6th August 1898, No. 31.

The Operative Treatment of Varicose Veins of the Lower Extremity.

In addition to the mechanical and anatomical conditions which favour venous stasis in the long saphena and its tributaries, there are also changes in the walls of the veins themselves, of the nature of sclerosis, similar to that met with in arteries. The cause of this is unknown, but to a certain extent it may be inherited. Varicosity of the vein results from sclerosis of its walls as well as from hindered outflow. The ligature of the saphena vein in the thigh, although very successful in improving the condition of an attendant ulcer of the leg, does not much benefit the chronic œdema and eczema which may persist after the ulcer has healed. The results of ligature of the saphena in the thigh may prove still more disappointing where collateral veins from the external saphena and from the deep veins open into the main trunk above the point of ligature, or where the internal saphena is duplicated and only one of them is tied; it is recommended, therefore, by Ledderhose of Strasburg to investigate very thoroughly the anatomical arrangement of the veins in each individual case before operation, and to apply the ligature high up near the saphenous opening. If the epigastric and pudendal veins open into the internal saphena trunk, they should also be ligatured.

To get rid of the œdema and eczema of the leg, which may persist in spite of the above, and which depend very largely on blocking of the lymphatic vessels and spaces, Ledderhose makes several longitudinal incisions through the skin and cellular tissue on the lateral and posterior aspects of the leg, extending from the ankle to the knee. These incisions are made while the limb is suspended in the vertical position, and are closed by a continuous suture. The results from the combined procedure have been much better than from simple ligature of the veins, or from the method of complete circular incision below the knee.—*Centralbl. f. Chir.*, Leipzig, No. 33, 20th August 1898.

SUPRAPUBIC CYSTOSTOMY FOR PROSTATIC ENLARGEMENT.

PROF. PONCET of Lyons gives evidence of his bias for the above method of interference, in troublesome cases of enlarged prostate, in recording 114 operations which he has performed during the last ten years. The steps of the procedure are the same as in suprapubic cystotomy, excepting that, inasmuch as the aim of the surgeon is to establish a permanent outlet for the urine, the edges of the wound in the bladder are stitched whenever possible to the edges of the wound in the abdominal wall. Besides tending to secure greater permanence of the opening, this counteracts the retraction of the edges of the wound in the bladder, which is usually considerable, and lessens the risk of infiltration of urine.

Poncet recommends the operation—(1) In those cases of enlarged prostate in which there is a mechanical and more or less insurmountable difficulty in urinating, and in which catheter life is impossible, from whatever cause. Poncet prefers cystostomy to the use of the aspirator, or to the tying in of a catheter. (2) In cases in which septic infection is the prominent feature, and is the source of danger to the patient, where cystitis persists in spite of skilful catheterisation and irrigation of the bladder. The mortality is shown in the following table :—

Class I. Cystostomy for mechanical difficulty, without appreciable urinary infection, . . .	Cured 37.	Died 2.
,, II. Cystostomy in infected cases, with lesions in kidney, etc., ...	,, 50.	,, 25.

The mortality will be seen to depend, not upon the operation *per se*, but upon the conditions for which it is performed. The state of the kidneys bears about the same relation to the mortality in operations on the bladder, as the state of the intestine in operations for strangulated hernia.

Regarding the later functional results of cystostomy, it was found that in thirty-four cases, seen from six months to seven and a half years after the operation, there existed what may be described as an artificial urethra, possessing a vesical orifice and a skin orifice, and a channel from 3 to 6 cms. in length, lined with mucous membrane, and surrounded by a fibro-elastic ring. Of these thirty-four cases, fourteen had perfect continence, seven incomplete, while thirteen were incontinent. In the first group there were patients who could retain their urine for three or four hours, who never passed a drop by the penis, and who, on emptying the bladder by the fistulous opening above the pubes, could project the stream for a yard or more and never soil their clothes. Those with incontinence had to put up with the inconvenience of a urinal.—*Lyon méd.*, No. 32, 7th August 1898.

Clinical Observations on Muscular Rheumatism.

Dr. S. Erben has studied with great care the anatomy and physiology of this condition, and has arrived at conclusions which differ from those generally accepted.

In twelve cases of rheumatic stiff-neck, he could find no evidences of muscular rheumatism; the attitude of the head was not the result of any pathological shortening of one sterno-cleido-mastoid. The head attitude was primary, being adopted to prevent pain; the existing muscular contraction was secondary, and was assumed in order to keep the head rigid. Tenderness was always present in the convex side of the neck, and did not correspond to any muscle, either in position or in extent. The tenderness was specially marked over the spines of the upper four cervical vertebræ. The lateral inclination of the head could be increased without causing pain; rotation of the head was possible in either direction; on the other hand, any inclination towards the convex side was resisted. The author therefore infers that the malady is situated either in the intervertebral joints, or in the cervical nerve roots of the convex side. This inference is not incompatible with the capacity for rotation of the head, for this movement takes place almost exclusively at the joint between the odontoid and altas. In 200 observations of lumbago, the author was also able to exclude any disease of muscle. According to the special seat of tenderness, he divides his cases into three groups. The first, which includes 119 of the cases, depends on an affection of the joints of the lumbar vertebræ, and is characterised by tenderness over these joints, and by diminution of lateral flexion of the lumbar spine on the same side. The second, of twenty-one cases, is related to neuralgia of the cutaneous nerves, which proceed from the posterior root of the third lumbar nerve. The tenderness is absent over the vertebral joints, but is present in the area of the distribution of the nerves. Pain is elicited by inclination of the spine towards the sound side, while deviation towards the affected side is either less painful or free from pain altogether. The third group includes cases in which there is a combination of joint affection and neuralgia.

In the remaining twenty-four cases, diagnosis was impossible in nine. The others were related to chronic alcoholism, commencing tabes, and to osteomalacia.—*Centralbl. f. Chir.*, Leipzig, 10th September 1898.

OBSTETRICS AND GYNÆCOLOGY

UNDER THE CHARGE OF

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Removal of the Uterus and Vagina en masse by the Suprapubic Method for the Radical Treatment of Cancer of the Cervix.

X. O. Werder (*Am. Journ. Obst.*, N. Y., March 1898) refers to the frequent recurrences after operations for malignant disease of the uterus, and advocates the removal of the whole or part of the vagina along with the uterus in these cases. The abdomen is opened and the uterus severed, as in ordinary hysterectomy, and the bladder freed from it; the dissection is continued downwards, so as to free the anterior wall of the vagina from the bladder. The recto-vaginal space is next entered, and the posterior vaginal wall separated from the rectum; finally, the lateral attachments of the vagina are freed. The uterus is then pushed into the pelvic outlet, and the vagina inverted by traction from below, until it can be amputated above the prolapsed fundus.

He proceeds to record a case in which a cauliflower growth of the vaginal portion of the cervix completely filled the upper part of the vagina, and involved the anterior vaginal wall. On 5th January 1898, the growth was removed with a sharp spoon, the surface cauterised, and the patient then prepared for laparotomy. On opening the abdomen, both ovaries and tubes were adherent, and the left tube contained an ounce of pus. These, along with the uterus, were removed, as briefly described above, and the patient made a good recovery.

The author holds that by his method more permanent cures can be effected, even in advanced forms of disease, as not only can the vagina be extirpated, but, if care be taken to push the ureters aside with the bladder, the greater part of the broad ligaments also; and as the operation can be conducted without touching the diseased cervix with the fingers, there is less risk of inoculation of the healthy tissues during the operation.

Continued Irrigation of the Uterus *versus* Hysterectomy in Acute Puerperal Septic Metritis.

Horace Manseau (*Montreal Med. Journ.*, July 1898) reports seven cases of acute puerperal septic metritis which were treated by continued irrigation of the uterus, and holds that this method of treatment, preferably preceded by curettage, if persisted in, may prevent recourse to the severe operation of hysterectomy. All the seven cases recovered, five of them again became pregnant, while two were lost sight of.

His method is best shown by briefly describing one of his cases—3-para, æt. 28. Normal labour at term. Placenta intact, also perineum. On fourth day had a rigor; temperature 103°·5, pulse 126. Vaginal douching proved ineffectual, also intra-uterine douches at intervals of three hours, the temperature on fifth day being 104°·5, pulse 135. On sixth day, continued irrigation with sterilised water was begun, and continued for twelve hours at the rate of about seven or eight gallons per hour. On seventh day, temperature 100°, pulse 115, and general condition improved. Irrigation was stopped five hours later, the temperature rising higher than ever. On eighth day irrigation was resumed, and maintained for twenty-four hours, temperature falling to 99°·5, pulse 110. During the writer's absence the midwife stopped the irrigation, and on the tenth day the temperature was 106°·5, pulse 180. When next seen patient had had several rigors, was delirious with tympanites, and the vagina bathed with pus. Irrigation was resumed, seven to twelve gallons of water per hour being passed into the uterus for forty hours, with four intermissions of an hour each, the temperature falling to 100°. Even during the intervals the temperature rose, and on the twelfth day after a few hours' rest there was a slight rigor, the temperature rising to 101°. Irrigation was again commenced, and kept up for three days, with intermissions of not over three hours, when convalescence was established. Over 2200 gallons of water were passed into the uterine cavity in ten days. The recovery in this case is the more remarkable, as pneumonia developed on the tenth day. The writer holds that the result of this treatment merits its greater use, as the pelvic organs are preserved, and future pregnancy rendered possible.

The Treatment of Brow Presentations.

Solowieff (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 30) refers to the usual terminations of an original brow case, and to the dangers for mother and child of persistent cases. He quotes the statistics of the Moskaw Maternity for the past ten years, thus:—

Face cases, 21, of which—
17 terminated without assistance.
2 ,, with forceps.
2 ,, with craniotomy.
All mothers recovered.

Child mortality, 14 per cent., which is attributed to the associated pelvic contraction.

Brow cases, 18, of which—
10 terminated with turning and extension.
1 ,, with turning and forceps.
1 ,, spontaneously.
1 ,, with occipital presentation.
5 ,, with face presentation.

With reference to the last termination, Solowieff describes a method of converting an original brow into a face case, which he considers new and original. Five cases are given in detail, illustrating this plan, which consists in introducing the forefinger into the child's mouth, and thus drawing the chin towards the brow, and retaining the finger here till a pain fixes the head in the new position. He recommends this method on account of its (1) simplicity, (2) avoidance of injury, (3) diminished danger of infection as compared with the operation of turning, and (4) favouring rapid termination of labour.

Extra-uterine Pregnancy at nearly Full Time—Laparotomy—Extraction of a Living Child—Recovery of Mother.

Neugebauer (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 30) refers to the collection by Harris of seventy-five cases of extra-uterine pregnancy, where the fœtus reached a viable age, and operated on with the following results:—

First 25 operations, . . 3 recoveries for mother.
Second 25 ,, . . 16 ,, ,,
Third 25 ,, . . 17 ,, ,,

Neugebauer records the following case:—Patient, æt. 36; two children; one abortion; last pregnancy two and a half years previous; some days after last menstruation, had six weeks' menorrhagia, with excessive pain; four and a half months later, felt movements, causing such severe pain as to necessitate morphia; fœtal heart heard at umbilicus; fœtal parts distinctly felt; uterus retroverted; sound entered 11 cms. Röntgen rays gave negative result. Operation at ninth month. On opening the abdomen, breech protruded; complete absence of liquor amnii and amniotic sac. After extraction of child and ligature of the cord, the placenta, which was inserted on the posterior bladder and anterior uterine wall, separated spontaneously, and only round its margin was there found any trace of sac, the child lying free in the abdomen and surrounded by coils of intestine. Right appendages normal, on the left side extensive adhesions. Child died nine hours after birth, and mother recovered, with a fistula.

Neugebauer discusses the case under the following heads:—

1. Was the case primary abdominal, or secondary to rupture of the tube? The condition of the left appendages found at operation pointed to early rupture and subsequent abdominal development.

2. Complete absence of the sac round the fœtus, accounted for by probable early rupture of tubal pregnancy.

3. The insertion of the placenta (which was divided into three lobes) on to the vesico-uterine fold.

4. The spontaneous separation of the placenta, probably from uterine contractions expelling that portion of the placenta attached to the anterior uterine wall.

5. The slight hæmorrhage from the placental site, controlled by gauze pressure.

THERAPEUTICS.

UNDER THE CHARGE OF

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Germicidal Action of Holocaine.

Holocaine hydrochloride, a body produced by the combination of phenacetin and paraphenetidin, and occurring in small colourless crystals, has been a good deal used in 1 per cent. solution as a local anæsthetic in operations on the eye. Randolph (*Johns Hopkins Hosp. Bull.*, Baltimore, July 1898) states that he has used it in fifty-four cases (iridectomy, cataract extraction, tenotomies, foreign bodies, etc.), and found that as an anæsthetic it is as efficient as cocaine. Anæsthesia was produced in a little over two minutes, and the same number of instillations is required as when using cocaine. To investigate its alleged germicidal properties, experiments were made with a 1 per cent. solution on various pyogenic organisms, and it was found that it exerts an inhibitory effect on their growth, and kills them in a period somewhere within twenty-four hours. Exposure to a 1 per cent. solution for periods of five to thirty-five minutes, showed in every instance a marked effect on the growth of colonies. Randolph states that he has never observed drying of the cornea and desiccation of its epithelium, nor dilatation of the pupil, after its use, whereas, after cocaine, blurred vision and photophobia are often present for hours.

ACTION OF CERTAIN DRUGS AND MINERAL WATERS ON THE SECRETION AND COMPOSITION OF HUMAN BILE.

W. BAIN has made observations on a man, æt. 49, with biliary fistula after an operation for gallstone, but otherwise in good health, and between three and four months after the operation (*Journ. Balneol. and Climat.*, London, 1898). He was put on a nearly uniform but not rigidly fixed diet, and took daily 36 grs. of purified ox bile in three doses, the object of this being to approximate his biliary condition to the normal. The bile was collected by Arbuthnot Lane's biliary tube without any loss. Bain estimated the daily quantity, the total solids, and the bile salts, and without medication the first amounted to about 28 oz., the second to about ½ oz., and the third to about 60 grs. He found that—(1) Both the quantity of bile and the bile solids are increased by the old sulphur spring (Harrogate), Kissingen Spa (Harrogate), Carlsbad mineral water, euonymin, benzoate of sodium, and salicylate of sodium; (2) podophyllo-resin and iridin augment the bile solids without appreciably affecting the quantity of bile; (3) Montpellier spring (Harrogate) and podophyllo-toxin appear to diminish slightly both the quantity and the solids; (4) hot water and soda water in pint doses do not seem to increase the biliary secretion; (5) salicylate of sodium increases the secretion of uric acid in the urine.

(It may be stated that these observations differ in their results from all the more recent experiments, which seem to indicate that bile itself is the only substance which definitely and distinctly increases the biliary flow.)

ACETATE OF THALLIUM IN HYPERHIDROSIS.

HUCHARD (*Bull. Acad. de méd.*, Paris, 17th March 1898) reports on the action of this drug first introduced by Combemale of Lille. It was used to stop the excessive sweating of phthisis, in doses of 1½ grs., given as pill, and in severe cases up to 3 grs. even; out of thirty cases, twenty-eight received complete relief; one dose often sufficed, and rarely did it require to be administered for a longer period than seven days. It is best given about an hour before the sweating is expected, and if marked improvement does not take place by the fourth day it is useless to continue the administration. Although acetate of thallium is undoubtedly poisonous, yet in the above doses it seems to be harmless, except that it causes alopecia of the scalp, sometimes with startling suddenness. Huchard confirms its marked action in sweating, but finds even a few doses to cause extensive shedding of the hair, and this he regards as fatal to its employment.

AN UNUSUAL CASE OF ARGYRIA.

KRAUS reports the case of a man, æt. 63, who for about ten years painted twice daily on the pharynx, to counteract chronic inflammation, a solution of silver nitrate, which he himself prepared by dissolving a piece about the size of a pea in two or three tablespoonfuls of water (*Allg. Wien. med. Ztg.*, 1898, No. 29). About a year ago the man observed that the skin of his face and head and his lips had become of a greyish colour. The discoloration extended, at the time of examination, down to the lower part of the neck, and the face was of negro-like blackness. The conjunctival mucous membrane was greyish in colour, that of the mouth reddish grey in parts, but the gums were more distinctly discoloured. The urine contained no silver.

ORTHOFORM GIVEN INTERNALLY.

BESIDES its local anæsthetic effect on raw surfaces, observations made in Leyden's clinic have shown that orthoform is absorbed from the intestinal canal, and is eliminated somewhat changed in chemical composition by the kidneys. The dose is 15 to 20 grs. per day, and it is said to relieve pain in cystitis and gonorrhœa. The urine does not readily undergo putrefaction during its administration.—*Deutsche med. Wchnschr.*, Leipzig, 30th June 1898.

TETANUS TREATED BY THE INTRACEREBRAL INJECTION OF ANTITOXIN.

ROUX and Borrell used this method in animals with success. In man two cases only have hitherto been published, one by Chauffard and Quénu (*Presse méd.*, Paris, 18th June 1898), which recovered, and one by Bacaloglu (*Gaz. d. hôp.*, Paris, 21st June 1898), which died. Garnier now reports a second successful case (*Presse méd.*, Paris, 21st August 1898). The patient was a man, æt. 53, who became ill on 5th June, and on the evening of the 6th had marked symptoms of not very severe tetanus. 10 c.c. of antitetanic serum were injected into a vein, and large doses of chloral hydrate were given by the rectum. This treatment was continued till the 9th, but his condition became very much worse, and death threatened to ensue from the frequent convulsive attacks. Trephining was performed under ether, and 6 c.c. of a special serum was injected into the cerebral tissue—3 c.c. very slowly into each hemisphere, just in front of the fissure of Rolando. On recovery from the anæsthetic the convulsions recommenced, and were very severe during the night. Next morning there was distinct improvement, and more serum was given subcutaneously. The improvement was very marked by the next day, and the antitetanic and chloral treatment was continued. Recovery went on slowly, and not uninterruptedly, till the 12th July, when he was practically cured. (In spite of the author's opinion of the efficacy of this method of treatment, the clinical history does not differ from that of many cases of tetanus which have recovered without receiving antitetanic serum. The tetanus poison affects the spinal cord rather than the brain.)

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Some Rare Tumours.

1. *Cavernous angeioma in the wall of the right auricle.*—Neoplasms are very rarely found in the heart wall, and the angeioma described by Rau (*Virchow's Archiv*, 1898, Bd. cliii. Heft 1, S. 22) is chiefly of interest on account of its rarity. It occurred in the heart of a labourer who died of tubercle of the lung and parenchymatous nephritis. It was situated beneath the endocardium, close to the fossa ovalis. It was somewhat bullet-shaped and of the size of a small cherry. Its general colour was a dark bluish red, with yellow parts here and there. The heart muscle in its neighbourhood was considerably thickened. The contents of the tumour resembled blood-clot, in which were scattered several white bodies like sago grains. Several of these bodies were harder than the others, and of a yellow colour. When treated with HCl, they were found to contain carbonate of lime. All of these bodies, both white and yellow, had distinct capsules in which isolated cells with distinct nuclei could be made out lying in a structureless ground substance. The heart muscle was flabby, and showed generally a condition of fatty degeneration and brown atrophy. Microscopically, the tumour was seen to be everywhere surrounded by a capsule, from which septa passed into its interior, dividing it up into loculi. In structure the capsule and septa were composed of white fibrous tissue, very rich in elastic fibres. The loculi contained ordinary blood or a homogeneous tissue resulting from the disintegrated blood corpuscles. White blood corpuscles were scattered here and there. The solid bodies found here and there were thrombi, some of which had become calcified. The loculi were everywhere lined by a single layer of endothelium, so that the tumour corresponded in all respects with a typical cavernous angeioma. A glance over the literature of the subject shows how very rarely is a similar condition met with, two other cases only being recorded, one by Czapek (*Prag. med. Wchnschr.*, 16 Jahrg. No. 39), and the other by Skrzeczka (*Virchow's Archiv*, 1857).

2. *The true neuroma.*—Knauss (*Virchow's Archiv*, 1898, Bd. cliii. Heft 1, S. 29) gives particulars of a remarkable case of a multiple true neuroma, and reviews the literature relating to ganglionic neuromata particularly.

The patient was a girl of 11 years of age. The parents were healthy, and had four other healthy children. She was rather small for her age, but stoutly built and of a lively disposition. In the third year of her life there appeared a number of small swellings under the skin of the trunk. They slowly and uniformly increased in size and number, but were never painful. They looked like flask- or bullet-shaped swellings of the skin, distributed irregularly all over the trunk and upper part of the thigh. The head, forearm, hand, leg, and foot alone were free. They lay beneath the skin, which was stretched over them. They were not tender on pressure. They were firm and elastic. They varied in size from that of a cherry to that of a hen's egg, and the largest, about the size of an orange, just below the umbilicus, was first excised. At this time there were sixty-three or more similar swellings in all. He gives a careful and precise account of their positions. Electrical reactions along the course of the nerve trunks were normal, and in all other respects the patient was healthy. A number of the largest of the tumours from the region of the mons veneris were excised, and in addition a small isolated one with the skin over it, and the tissue surrounding it was cut out. They presented similar chartacers, each having a thin but distinct capsule.

They could be easily shelled out from the surrounding fat and connective tissue, and in no case presented any pedicle or attachment. Section of the swellings presented a homogeneous light yellow transparent appearance, with thin white fibrous-looking streaks running through it. The consistence was firm and elastic. The microscopic investigation, conducted according to the most approved and modern methods, showed all the tumours to consist alike of nerve fibres both medullated and non-medullated, and very numerous ganglionic nerve cells. The non-medullated nerve fibres were by far the more numerous. The nerve cells were rounded or oval, mostly fairly large. Their protoplasm was granular or clear. A round nucleus was generally present, with clear nuclear substance and a distinct nucleolus. They were not unlike the ganglion nerve cells of the sympathetic, and many of them were seen to have non-medullated nerve fibres, coming from them both unipolar and bipolar. None of them were seen to be in connection with the medullated nerve fibres, whose numbers and relationships were clearly demonstrated by the Weigert-Pal method. From a careful study of his own case and of the literature of the subject, he comes to the following conclusions:—(1) True neuromata undoubtedly, as Virchow believed, occur. (2) The differentiation of neuromata into true and false is well founded. (3) The observations of earlier observers, who rarely found ganglion cells to occur in cases of true neuromata, is verified by their occurrence in this case. (4) The sympathetic nervous system seems to play an especial *rôle* in the production of true neuromata and more particularly of the ganglion nerve cells.

3. *Epithelial cyst of the œsophagus.* — Rau (*Virchow's Archiv*, 1898, Bd. cliii. Heft. 1, S. 26) describes a case met with at the autopsy of a man, æt. 35, who died of tuberculosis of the lung and large intestine. The cyst was clear and fluctuating, somewhat larger than a hazel-nut, and situated in the region of the lesser curvature of the stomach, just at the junction of the œsophagus and stomach. From its anatomical position it was difficult to say whether it belonged to the former or the latter, but more particular examination, especially microscopically, showed that it had taken its origin from the œsophagus, probably after the manner of a diverticulum. The contents of the cyst were clear, and its cavity was entirely shut off from the lumen of the stomach, and also from that of the œsophagus. Its lining

membrane was epithelial, the layers resembling those met with in the embryonic œsophagus. Outside this there was a well-marked muscular layer, continuous at its seat of attachment with the longitudinal muscular layers of both the œsophagus and the stomach.

4. *Hydatid cyst of the breast.*—Vitrar (*Centralbl. f. Gynäk.*, Leipzig, 9th April 1898) records the case of a woman, æt. 21, who noticed a swelling in her breast about the time of the birth of her first child. It was quite painless, distinctly movable, and almost the size of a hazel-nut. It grew rapidly, and five months later she sought advice about it. It was diagnosed and removed as a cystic fibro-adenoma, and was then found to be a true hydatid cyst.

5. *Retroperitoneal cyst simulating pancreatic cyst.*—Sarwey (*Centralbl. f. Gynäk.*, Leipzig, April 1898) described a case in a female, æt. 11. There was a large fluctuating tumour in front of the transverse colon. Its position led to the suggestion that it was of pancreatic origin, but chemical examination of its contents showed no pancreatic ferment. The fluid resembled milk, and gave the characters of lymph. The cyst had thus originated in the peritoneum, and, having forced its way through the gastrocolic omentum, had come to lie chiefly in front of the transverse colon. It was successfully and fairly easily removed, and the patient made a complete recovery.

THE PATHOLOGY AND MICROSCOPIC ANATOMY OF HUNTINGDON'S CHOREA, WITH REMARKS ON THE DEVELOPMENT AND TREATMENT OF THE DISEASE.

COLLINS (*Am. Journ. Med. Sc.*, Phila., Sept. 1898) makes an interesting contribution to this rare and little known disease. The case was that of a male, æt. 55, who suffered from the disease for ten years before it carried him off. The hereditary and clinical histories call for no special notice, but the pathological changes found after death are of greater interest, in view of the very few post-mortem results that have been so far recorded and their somewhat contradictory results. He describes the changes in great detail, and gives some good illustrations, but it will suffice here to give his summary of them—(1) Thinness and atrophy of cortex, evidenced by diminution of weight, by the shallowness and breadth of fissures, by narrowness of gyri, and by thinness of cortical mantle; (2) a mottled tier-like or streaked appearance, and a cribriform state on cross-section of the brain in the fresh state, due, as afterwards found, to diminution in number and size of ganglion cells, particularly those of deeper layers, to an increase in size of the perivascular and pericellular spaces, and to increased patency of the blood vessels. The microscopic changes are summarised as follows:—(1) A decay or slowly growing degeneration of the ganglion cells of the cortex throughout the brain, involving principally the layers of large pyramids and polymorphous cells, particularly evident in the Rolandic region, very much less so in the anterior pole of the brain, and incomparably less so in the posterior pole. (2) Increase of glia tissue, most marked in those sections that show greatest cell implication, but nowhere sufficiently prominent to constitute sclerosis. The increase of the glia tissue, although rather universally distributed, is most conspicuous about the blood vessels and ganglion cells. (3) Enlargement of the pericellular spaces and distension of the perivascular spaces. (4) Slightly diseased blood vessels, the principal change being a proliferation of the nuclei of the tunica externa and a thickening of the tunica intima. This implication of the vessels, which is neither regular nor symmetrical, is evidenced to a greater degree in one section than another. No punctate hæmorrhages were observed. (5) Relative paucity of the medullated constituents of the cortex. (6) Slight degeneration of the crossed pyramidal tracts of the spinal cord. He considers that his results agree in the main with those of Dana, Oppenheim, and Clarke, and regards the characteristic lesion of the disease as a slight parenchymatous degeneration of the cortex, with consecutive and secondary changes in the interstices and vascular system.

Central Softening of the Spinal Cord in Syphilitic Meningitis.

This very rare condition, of which only four cases have been described, is liable to be mistaken for syringomyelia. Wullenweber (*München. med. Wchnschr.*, 9th Aug. 1898) gives particulars of another case, in which the symptoms and clinical course did not follow those of true syringomyelia. The patient was a female, æt. 28, who had had syphilis. The illness began with pain in the back, followed by headache, then weakness and rigidity of legs. The patellar reflex disappeared. Later, painful spasmodic contractions often occurred in right leg, and later still girdle pains became troublesome. The legs finally became atrophied and completely paralysed, and bedsores and paralysis of sphincters developed. Post-mortem examination disclosed a central cavity, localised to the grey matter, extending from the lower lumbar to the upper cervical regions, also syphilitic meningitis and syphilitic disease of the vessels. He considers that the central cavity was due to a necrosis following upon an anæmia caused by endarteritis and compression of the blood vessels, the compression resulting from the cicatricial tissue in the meninges.

INSANITY.

UNDER THE CHARGE OF

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Degeneration of Fibres in the Medulla Oblongata in General Paralysis.

Bechterew (*Centralbl. f. Nervenh. u. Psychiat.*, Coblenz u. Leipzig, September 1898) describes alterations in the fibres of the mid-brain and medulla in general paralysis. In the medulla oblongata and in the pons he found the whole regions of the formatio reticularis (with the exception of the root fibres), of the central tegmental paths, the intervening olivary regions, the lemniscus, and the trapezoid body, totally degenerated. Also both pyramids and a considerable portion of the fibres of the restiform body, with the exception of the fibres between the olivary body and the cerebellum, were much degenerated.

In cases in which the disease was of short duration, the degenerative process did not attack so large an extent of fibres, and the degeneration itself was not so intense; but degeneration of the fibres in the portions already mentioned was never completely absent in any of the more or less well-marked cases. Both the degree of the degeneration and its extent depended upon the stage of the disease and on the individual peculiarities of each separate case. He considers that the majority of these degenerations are due primarily to atrophy of nerve cells in the cortex, and secondarily to degeneration of cells which have taken up the function of the diseased cortical cells.

Flechsig's Treatment of Epilepsy.

This treatment has been for some years subjected to trial in various countries. It consists in the administration of opium, commencing with minute doses, say 5 minims of the tincture three times a day, and gradually increasing the dose, until 90 to 120 minims are given in the course of a day. The opium is then suddenly discontinued, and ordinary doses of the mixed bromides are substituted for it during the course of three or four weeks. It has been claimed by Flechsig that at the end of the treatment the fits cease, and that some of the cases permanently recover. Should the fits not cease at the end of the treatment, it is to be recommenced again.

Schroeder (*Centralbl. f. Nervenh. u. Psychiat.*, Coblenz u. Leipzig, August 1898) publishes the records of his experiments with this treatment, of which the following is the result:—Out of twenty-three patients, two remained free from fits for seven and a half months. In all the rest the fits returned again after a shorter or longer interval; but in the majority of cases they were diminished in frequency. The previous administration of bromide made no difference in the results.

He instances one or two spontaneous recoveries from epilepsy without any medicinal treatment, and he thinks that the patients experimented on by different physicians have been too dissimilar with regard to age, causation, and other circumstances, to make comparison possible. He thinks that the treatment should be tried with young people, in whom the disease has been of short duration. He believes that Flechsig's treatment is not without risks, and that the patients should be treated under medical care, preferably in bed, and if possible in an institution.

The Pathology of Acute Delirious Mania.

Cristiano (*Riv. quindic. di psicol., psichiat. neuropat.*, Roma, June 1898) gives the result of his examination of the nervous system in three cases of this fatal disease. For the study of the cells he made use of the Nissl and Golgi methods, and for the study of the fibres, of the

Weigert and Weigert-Pal methods. His examinations extended over the cerebral and cerebellar cortices, the bulb, the spinal cord, and some of the larger nerve trunks. In the brain cortex he found extensive chromatolysis of the cells, implicating first of all the marginal zone of the cells, and ending in diffuse chromatolysis, with degeneration of the processes and evulsion of the nucleus. Every form of cell malformation and destruction, up to the total disappearance of the cell and its processes, is described. With Golgi's method the usual degenerative changes in the dendrites, such as varicosity, loss of gemullæ, and necrosis, were found. All parts of the cerebral cortex appeared to have suffered equally. The cerebellar cortex was similarly involved, but the destructive cellular process was there less diffuse and grave. In the cells of the anterior horn of the spinal cord the degeneration was of the same intensity as in the cerebral cortex; but the cells in the posterior horn showed only a limited degree of chromatolysis. In the early stages of chromatolysis nuclear infiltration of the cells does not appear to be so extensive as it undoubtedly is in the later stages. The blood vessels did not show any nuclear infiltration, thickenings, or degeneration of their walls. The blood vessels themselves were filled with corpuscles, but the dilated perivascular canals only contained a few rather fine granules of pigment. The cerebral meninges and the neuroglia elements appeared to be normal. The nerve fibres of the cerebral and cerebellar cortices showed extensive atrophy; sometimes they presented a moniliform appearance, like a rosary; at other times they appeared short, truncated, and split up; while in certain regions whole tracts of fibres had disappeared entirely. In the pons, medulla, spinal roots, cranial nerves, the median and sciatic nerves, transverse section and staining with Weigert's method showed that the myelin sheath was atrophied and sometimes wanting. The axis cylinders were indistinct, swollen, and sometimes deformed. Occasionally a diffuse staining rendered the sheath and axis cylinder indistinguishable.

From these facts it appears that acute delirious mania is a universal and simultaneous affection of the whole nervous system. The disease runs such a short course that it is more likely that the cells in the cord and the nerve fibres degenerate primarily as the result of toxic infection, than as the result of secondary degeneration from a distance; and there can be no question that the infection of the interior spinal cells, and of cells in the mid-brain and medulla, add considerably to the great mental confusion and hallucinative excitement which are among the chief symptoms of the disease.

Melancholia of Leprosy.

In support of a contention for the existence of this affection, A. S. Ashmead (*Alienist and Neurol.*, St. Louis, July 1898) quotes from a paper of Meschedes of Königsberg, read in the Section of Neurology of the International Congress at Moscow in 1897. Meschedes considers that leprosy exerts a direct influence on the development of dementia, the cerebral phenomena resulting possibly from some irritating lesions of the nervous system, brought on either by Hansen's bacilli or by their toxins.

He bases this theory on a case of psychosis with which he had recently met in a leper. The patient, a man æt. 28, showed the first symptoms of leprosy in 1891. In December 1896, without any obvious cause, he was suddenly attacked with symptoms of acute dementia, which necessitated his admission into Professor Meschedes' wards. He was discharged in four and a half months, having recovered from his mental affection, and was transferred to the medical wards, to receive treatment for the leprosy itself.

After a short initial period of melancholia, during which the patient refused to take food, hallucinations of all the sense organs suddenly developed, with excitement, oppression, intense motor discharges, and delirious ideas of a religious nature. After a few remissions, and an attack of megalo-mania, the mental phenomena gradually improved and finally disappeared entirely.

It was noted, as constituting the peculiarities of this case, the sudden explosive onset of the mental trouble, and also the existence during the initial period of evident symptoms of cerebral and cutaneous congestion. The skin of the face was particularly red and swollen, and the cutaneous sensations evidently constituted the main starting point of the hallucinations. The patient fancied that he was being tortured; he felt a sensation of heat which he himself estimated to have been fourteen times higher than the normal body heat; there also existed a state of sexual excitement of unusual intensity, and a disturbance of the muscular sense, which gave him the impression that the whole body was being lifted. The congested state of the skin subsided on parallel lines with the retrogression of the psychic disorder. The last hallucinations of the period of decline also manifested themselves in the sphere of cutaneous sensation; the patient had the impression that snakes were creeping round his legs.

The predominance of tactile hallucinations pleaded in favour of the hypothesis of a direct action of the leprosy bacilli on the nervous system.

Professor Meschedes added that one of the patient's brothers had also suffered from dementia. No other member of the family had ever exhibited any psychic disorders, so that there can be no question in the case of any hereditary psychopathia, properly so called, but a simple family predisposition to mental trouble. The question might be asked, whether the attack of dementia was not due, in the case of the patient's brothers, to some latent leprous infection.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF

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MIDDLE-EAR DISEASE IN RELATION TO LIFE INSURANCE.

At the recent meeting of the British Medical Association held in Edinburgh in July, the members of the Section of Laryngology and Otology discussed, conjointly with the Life Assurance Section, the bearing of middle-ear suppuration upon insurance. The debate, which was introduced by Dr. M'Bride, was taken part in by Drs. Thomas Barr, Urban Pritchard, M'Kenzie Johnston, Herbert Tilley, Cresswell Baber, Mark Hovell, William Hill, Dundas Grant, L. H. Pegler, James Ritchie, W. L. Muir, Glover Lyon, and Mr. G. M. Low, Manager of the Edinburgh Life Assurance Company. Statistics on such a matter were far from satisfactory; there was considerable room for discrepancies; and even where statistics had been obtained, a difference was found to exist in the figures procured from different sources. Thus Schwartze of Halle showed that, from 1887–88 to 1896–97 (excluding the year 1891–92), seventy-six deaths occurred out of 3042 cases of *chronic* middle-ear suppuration, representing a death-rate of twenty-five per 1000, or ½ per cent. Gruber and his assistants investigated the post-mortems made in the Vienna Hospital from 1873 to 1894, comprising a total of 4073. Amongst these, there were 1806 instances of intracranial inflammation, and of these 232 were shown to be due to ear disease; that is to say, 0·58 per cent. In the reports of the Registrar-General for Scotland, in the ten years prior to 1896, there was shown to be one death from ear disease in a thousand of the total mortality from all causes, or ·1 per cent. All these figures probably under-estimated the actual total. Deaths occur from an intracranial suppurative lesion, otitic in origin, where no suspicion of such a primary condition has arisen, or where no note of the undoubted existence of suppuration in the tympanum has been recorded. Further, in the statistics taken from a general hospital, many fatal cases occurring in young children are not included, as they come under treatment in a special hospital. Granting, however, the possibility of a slightly higher mortality than these figures would seem to indicate, there was a general feeling expressed, that possibly the condition had not so important a bearing on life insurance premiums as had been previously thought. In reference to this point, also, it must not be forgotten that the larger number of deaths resulting from middle-ear complications occurred before the age of 35, that is, before the average age for insuring life is reached, thus indicating that the most dangerous period of life has passed before insurance is applied for.

Two suggestions were thrown out as to a more certain method of obtaining reliable statistics. One was, that a competent person should visit, after a few years, the homes, say, of 5000 hospital patients who had been treated for otorrhœa, and ascertain how many still lived. The nomadic tendency which exists amongst so many of this class of the population would make such a house-to-house visitation by no means a profitable one. The second scheme proposed, and one which might with perseverance be worked out, was, that the various cases of middle-ear suppuration should be grouped and classified by the aurist, while the actuaries proceeded to take up their statistics and see what was the actual death-rate of those cases which had passed through their hands, and what were the extra risks involved in these different groups or classes of cases. By classification in this way, rather than by dealing with "each individual case on its own merits," a more reliable method of discrimination would be obtained.

Other questions of greater detail were discussed. Candidates who presented themselves for life insurance, and who had suffered or were suffering from chronic middle-ear suppuration, were not passed without a special note being made on this point. Were their lives to be accepted without any reservation? Were they to be accepted with "loading"? Were they to be rejected by the office? It appears doubtful if the discussion under consideration helped very much in establishing a basis upon which to work in the future. Many points required to be considered by the medical officer before an opinion could be expressed. The social position and habits of life of the candidate must be taken into account, because a certain amount of risk might be accepted in the case of a man whose occupation or profession did not lead him to undue exposure, for whom surgical skill could be at once procured, or who was prepared to bestow the necessary attention upon his ear condition. In the second place, the clinical history of each case, and the local appearances to be observed, must be carefully noted; such points as its duration, the occurrence of occasional attacks of acute or subacute inflammation, with or without mastoid complications, and the presence and absence of pain, must all be inquired into. On examination of the ear itself, the position of the perforation should be carefully located, the presence of a minimum of discharge or a fœtid odour detected, granulations and caries noted; and the possibility of an existing otorrhœa being tubercular or associated with malignant disease should not be lost sight of. Lastly, and by no means the least important consideration was, how far the condition might be benefited by rational and long-continued treatment. A serious lesion which, in the opinion of the medical man, appeared to necessitate rejection or "a loading" of the life, might, after a period of more or less prolonged and careful treatment, or even with radical operation, be eventually accepted on the usual terms. It might in all fairness be made a condition by the office, that every candidate in whom otorrhœa existed should first submit himself to a regular course of treatment, and again present himself at a later date. A general excellent physical condition and a normal state of the other organs were practical points which should turn the balance in favour of the candidate's claims.

The Pathogenesis and Earlier Clinical Evidence of Laryngeal Tuberculosis.

Any addition to our knowledge of the pathology of tubercle of the larynx and of the means of detecting its presence in the early stages, must always be gladly welcomed. At the recent meeting in Edinburgh, there was read in the Section of Laryngology and Otology a valuable paper by Dr. Jobson Horne of London, which was beautifully illustrated by lantern slides, made from microscopic sections of larynges removed from patients who had died of pulmonary tuberculosis. None of the usual signs of laryngeal tubercle were visible to the naked eye. A study of these preparations had led the author to draw the following conclusions:—

The earliest histological changes noted were found in connection with *the lymphatics* situated in the walls of the ventricles of Morgagni. Here there was observed a proliferation of the parenchyma of the acini and efferent ducts, and the formation of masses of small round cells, distending and choking these ducts, and obliterating the glands. In these lymphoid masses, the presence of the tubercle bacillus was demonstrated; it was probable, therefore, that the bacilli, having once effected an entrance into the lymphatic ducts, acted as irritants and brought about this cell proliferation. The ventricles appeared to be suitable for the harbouring of the tubercle bacilli.

A demonstration was next given of the origin of the tubercular giant cell from the wall of a lymph space. In the first place, the tubercle bacilli were seen lying amongst the endothelial cells forming the wall of the lymph space; these cells divided, and the adjacent divided cells having fused, became separated off as the giant cell. Other changes were observed to have taken place in the tissues; there was a proliferation of the subepithelial blood vessels, and in the muscle fibres certain changes were noted at an early stage.

The commencement of the tubercular process in the lymphatics is an interesting observation, and, as Dr. Horne remarks, it would be natural to suppose that those parts which were rich in lymphatics would be the more common sites for infiltration and ulceration. This has been clinically verified; the inter-arytenoid region, the posterior third of the true cord, the ventricular band, and the epiglottis, are the parts more richly endowed in this respect, and more commonly ulcerated in laryngeal tuberculosis. The greater part of the vocal cords, on the other hand, which are free from lymphatics escape ulceration.

The second part of the paper described the clinical counterparts of these early pathological changes, and was based upon an examination of 359 larynges, in persons in whom there was reason to believe that pulmonary tubercle existed. *Disturbances of sensation* were noted, a diminished sensation being not infrequently associated with anæmia, and the more pallid the soft palate the greater appeared to be the tolerance to laryngoscopy. When in the course of the pulmonary condition the anæmia passed off, this tolerance often disappeared with it. *Anæmia* of the laryngeal mucous membrane was noted as present in 157 out of 359 cases. Sometimes this condition existed over the whole mucosa; in other cases, again, it occurred in patches. *Hyperæmia*, on the other hand, was observed in 117 out of 359 cases, and rather more frequently in the male sex—it might be transient or persistent, and did not amount to an acute laryngitis; this phenomenon was attributed to the proliferation of the subepithelial blood vessels already referred to. *Transient œdema* of the laryngeal mucosa, more particularly in the arytenoid and inter-arytenoid regions, along the false cords, and at the base of the epiglottis, was observed to alter the normal contour of the larynx—the symmetry of the arytenoid eminences might be thus lost. *Disturbances in the vocal function* were most often met with—it might not be more than a passing weakness of voice or loss of tone; sometimes dysphonia was complained of. Although the speaking voice was weak, the singing voice would be quite clear, and a sudden failure of the latter might occur, causing the patient for the first time to come and seek advice; the possibility of early tuberculosis under these circumstances should not be forgotten. *Impaired movement of the vocal cords*, distinct from paralysis, was observed, due probably to the changes in the muscles noted above. In all cases of so-called hysterical aphonia, the chest should be carefully examined for any evidence of pulmonary tuberculosis.

THE TREATMENT OF DYSPHAGIA IN LARYNGEAL TUBERCULOSIS.

IN the *Journ. Laryngol.*, London, September 1898, Dr. Eugene Yonge of Manchester reviews the various drugs which have been employed in the treatment of dysphagia in phthisical cases. The relief to be obtained from this painful symptom depends largely upon the selection of a suitable local anæsthetic, a substance which will be prolonged in its action, devoid of marked toxicity, not specially disagreeable to the taste, and not costly. He carefully tested a series of fifteen local anæsthetics, and while he found no ideal drug of this class applicable to every case, he found the following suitable and generally effective under various circumstances:—Cocaine, antipyrin, eucaine, orthoform, carbolic acid, guaiacol, morphia, and paramonochlorphenol. In the application of these drugs, it must be borne in mind that the absence of ulceration of the mucous surface is a contra-indication to the use of orthoform, guaiacol, and morphia, as they fail to produce anæsthesia when the mucous membrane is intact. The author found that *antipyrin* maintained its anæsthetic action for a longer time than cocaine, and the quantity required was never sufficient to give rise to toxic symptoms. A mixture of *cocaine* and antipyrin or of cocaine and carbolic acid was found useful when the drug had to be used for considerable periods, the total effect of the cocaine being strengthened without a corresponding increase of that substance. Iced solutions of 5 per cent. cocaine appeared to be at least double the strength of the same solution at the ordinary temperature. *Eucaine*, while less toxic than cocaine, was found weaker, and was indicated when some idiosyncrasy debarred the use of cocaine. *Orthoform*, a comparatively new local anæsthetic (Einhorn and Heinz, *München. med. Wchnschr.*, 1897), devoid of taste or smell, two valuable negative qualities, when applied to a cleansed, laryngeal ulcer, produced, in the great majority of cases, complete relief, commencing in a few minutes after its application and lasting for several hours. It is non-toxic, and in conjunction with its prolonged action it possesses very considerable advantages over cocaine in ulcerations of mucous surfaces. It is obtained in the form of a white crystalline powder, and its application can be made by means of a laryngeal insufflator. *Guaiacol*, with or without menthol in combination, had a sedative and antiseptic action in mild degrees of ulceration.

In dealing with the treatment by other methods than drugs, the author preferred rectal feeding, in exceptionally severe dysphagia, to the œsophageal tube, which caused so much distress and disturbance to the parts during its passage.

PUBLIC HEALTH.

UNDER THE CHARGE OF

CHARLES HUNTER STEWART, M.B., D.Sc.,

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Diptheria Prevalence and General Insanitary Conditions.

Dr. Giaguntá (*Gior. d. Soc. ital. d'ig.*, Milano, 1898, No. 8) communicates the result of an extended epidemiological inquiry into the incidence of diphtheria, during the twenty years 1877–1896, in the city of Catania (pop., 1896, 116,000). During the nine years, 1877–1885, the deaths per 10,000 at all ages were 15·8; while in the nine years, 1886–1894, they fell to 7·1; and in the five years, 1893–1896, they were only 2·7. These two nine-yearly periods were characterised by a sudden rise in the mortality and a slow decline, but the maximum in the first period (1879) was thirty-four per 10,000, while in the second period it was sixteen.

Taking the whole twenty years, the influence of season is very marked. The lowest month is August (4·8), and the highest is January (12·25); and taking the summer quarter as June, July, and August, it is 5·71; while the autumn and winter quarters are 10·9 each, and the spring 8·3. The meteorological elements which differentiate the seasons are temperature, relative humidity, and rainfall. Taking the whole twenty-years period, he shows by curves of temperature, relative humidity, and rainfall, that the two latter agree directly with the diphtheria death curve, while the first agrees with it inversely. This epidemiological inquiry establishes the fact, demonstrated in the laboratory, that moisture is favourable to the growth of Löffler's bacillus, and that, in common with all micro-organisms, sunlight is unfavourable to it. He discusses the part which catarrhal inflammations of the mucous membrane of the throat, etc., play in giving a nidus for the bacillus, as well as the question of mixed infection with streptococcus, staphylococcus, etc., being more likely at certain seasons and making the disease more fatal. The important consideration is the cause of this marked diminution in diphtheria mortality. Serum treatment is virtually not practised at all, and disinfection is little followed. There is no disinfection by the municipality, and no hospital for infectious diseases. It is in general sanitary improvements that the explanation is to be looked for. The old city, largely built on the somewhat steep lava slopes of Mount Etna, was chiefly made up of narrow streets, extremely filthy, and allowing of little circulation of air. There were no pavements, and the cesspools in the porous lava drained away readily into the soil and into the water of the nearest wells. He says these cesspools were much prized by the proprietors of the houses, as they never required emptying! Within the last twenty years this old quarter has been gradually abolished, and virtually a new city has been built, with wide and well-paved streets, which permit of the entrance of abundance of light and air. The soil, being protected from pollution by paving, is now purifying itself. An abundant and pure water supply has been provided, which permits of cleanliness both of the person, the houses, and the streets.

THE CARE OF THE CONSUMPTIVE POOR.

MM. **NETTER AND BEANLAVON** reported on this subject to the Paris Congress on Tuberculosis (*Presse méd.*, Paris, 1898, No. 64)—In Paris there are more than 6000 tuberculous patients chargeable to the administration of the "Assistance Publique." In the cases of the poor treated in their own homes, prophylaxis by disinfection of sputa, etc., is very difficult, and in the majority of cases almost quite illusory. But, however carefully the sputum is disinfected, they consider the patient still a source of infection to those near him, as, adopting the views of Flügge, they believe that in coughing without expectoration, and even in speaking, the bacilli are discharged for quite an appreciable distance into the air. Treatment in sanatoria is the only solution of the question, whether you view it from the point of curing or simply isolation, with its corresponding protection of those still unaffected. For cases in the early stages, sanatoria should be provided in the country, on sites specially selected as regards exposure, prevailing wind, soil, etc.; while in advanced cases, where isolation is the main feature (though cure is also aimed at), the sanatoria should be near the cities, to permit of the patients easily seeing their friends, and thus removing one of the objections to becoming inmates. Putting on one side the humanitarian question, the certain saving of life is a direct gain to the State. The Health Department of the German Empire calculates that, supposing 12,000 phthisical cases were annually treated, and that as a result of treatment 9000 of them can work on an average three years more; then, allowing £25 as the mean annual wage earned, the gain to the community, after defraying all expenses of sanatoria, is £375,000. But besides the upkeep of the sanatoria, the families dependent on the inmates must also be supported during the absence of the wage-earner. In Germany, where there is compulsory insurance against sickness, accident, and old age, an admirable method is followed. The insurance companies, finding that the most of their sickness pensions were for phthisical patients, made arrangements for sending them to sanatoria, and got part of the cost of their treatment there paid by the sick societies, which always pay the cost of medical treatment for their members. The expenses for the support of the families of the inmates incurred by the insurance companies are also in part defrayed by these sick societies. Thus in Germany the cases are got at the early stage where there is the highest percentage of cure, and the insurance companies recoup themselves for the expense of the treatment they have to meet by the diminished sickness pensions they have to pay. According to the authors, isolation hospitals are quite as costly and not nearly so efficacious as special sanatoria.

Knopf (*Med. Rec.*, N. Y., 24th September 1898) contributes a paper on the State and municipal care of consumptives. Besides the regularly enforced laws against bovine tuberculosis, and the hygienic and prophylactic measures against tuberculosis in man, through sanitary regulations and public instruction, every State or municipality must take upon itself the care and treatment of curable and incurable cases of tuberculosis among the poor and those who cannot afford to enter private sanatoria, or have at home the best possible treatment. Just as there are Commissions in Lunacy for determining when a person is a proper subject for State care as a lunatic, so there should be commissions, composed of general practitioners and health officers, for determining the admissions into a State or municipal consumptive sanatorium. This commission would medically examine the applicant and other members of the family, and report the condition of the patient's dwelling, and its previous history *re* tuberculosis. They would also determine whether the patient could pay for his treatment, and whether his family in his absence would become destitute. The author thinks there should be also a "maternity sanatorium," where tubercular mothers could go a few months before delivery and remain some time after—the children to be artificially fed or wet-nurses employed, and the mother treated under the best hygienic conditions. The provision of sanatoria for consumptives would diminish the incomes of medical practitioners, and hence, for all work done in connection with such institutions by medical men, they should be remunerated by the State or municipality.

THE DISINFECTION OF ROOMS OCCUPIED BY TUBERCULAR PATIENTS.

M. MARTIN, Inspector-General of Health for the City of Paris, describes (*Presse méd.*, Paris, 1898, No. 64) the practice in Paris and the difficulties there met with. Few private houses are so arranged that easy or thorough prophylaxis by disinfection, etc., is possible. Cracks in roof and walls, paper on the walls and fissures in the flooring, give abundant places for tubercular dust to gather, which is with difficulty reached by disinfecting means. In the dwellings of the poor, where all these conditions are accentuated, there is too frequently added general uncleanliness. What chance has prophylaxis when a one-roomed house occupied by a family, a member of which is phthisical, is at once kitchen, eating- and sleeping-room? Yet it is in such circumstances the most of the disinfections are carried out.

In 1892 the practice of disinfecting houses occupied by tubercular patients, either during their illness, after death, or before occupation by a new tenant, was begun and extends yearly. There were 10,000 such disinfections in 1897, and for the first six months of 1898 there were nearly 7000. Two years ago an investigation showed that there were 2500 phthisical poor living in their own houses. This was too great a number to cope with, considering the then existing disinfecting staff. A hundred cases were taken in different parts of the city, and only ten of these refused to allow disinfection. As a mean, each case had eight different disinfecting visits, though some of them that continued a year had as many as fifty.

Each case is supplied with two coloured-glass spitoons, in which water is generally put to a depth of about an inch. A solution of carbolic acid was first used, but the smell was found irritating to the patients. The used spitoon is to be cleansed every day by putting it into a pan of cold water, which is slowly heated to boiling, the contents being then discharged into the water-closet. But experience shows that in many cases this simple precaution cannot be carried out from the want of such an ordinary utensil as a pan, and during most of the year from the want of a fire. All soiled linen (handkerchiefs, etc.) used by the patient are removed weekly for disinfection by steam. After use it is required to be plunged into boiling water for five minutes, but this, for reasons already mentioned, is often impossible. In these circumstances such linen is recommended to be kept apart, pending its removal to the disinfector. At the weekly visit, the disinfected linen is returned and the infected linen taken away, and the water-closet and all utensils used by the patient treated with a disinfectant; cresol being as a rule employed. After death, cure, or removal, the house and its furniture is disinfected. The author points out the following, as the conditions of practical efficient disinfection:—(1) Certain and rapid destruction of pathogenic organisms; (2) relative harmlessness of the substance used both for the occupants and the furniture, etc.; (3) cheapness and ease of application; (4) as far as possible, absence of disagreeable smell. The gaseous disinfectants, according to M. Martin, cannot be recommended. Sulphurous acid, if used efficiently, requires a long time — twelve hours for the actual disinfection, and at least twenty-four hours more before the room can be used. Formic aldehyde has great germicidal power, but no method has as yet been devised to make it sufficiently penetrating. Moreover, twenty-four hours' exposure to this vapour is necessary, and the room cannot be occupied for some days later. Thus neither of these methods of disinfection are practicable in the cases we are considering.

The method chiefly followed in Paris is that of spraying with a solution of corrosive sublimate and common salt. This, if carefully and methodically done, and repeated after an interval of some minutes, causes such a thorough wetting and impregnation of the walls and roof, as to produce in a few hours a disinfection as complete as can be obtained in a much longer time by gaseous disinfection. Moreover, this thorough spray of the room and its furniture, requiring such a movement of the contents of the room, ensures at least at this time that it is washed out.

Whenever a tubercular patient seeks admission to one of the hospitals, his address is sent to the disinfecting department, which at once asks permission to disinfect the house. This is sometimes, however, not granted. The great obstacle to the popularising of disinfection in cases of tubercle, is that the patient is often stamped by his neighbours as plague-stricken, and is sometimes even compelled to leave his house. To remove all such objections and obstacles, the education of the public is necessary as regards the infectivity, the preventibility, and the curability of phthisis.

REPORTS OF THE MEDICAL SOCIETIES.

Glasgow Medico-Chirurgical Society.—*7th October* 1898.—Dr. G. S. Middleton, President, in the chair.—The President showed—(1) A case of paralysis, illustrating the difficulty of diagnosis between functional and organic disease. The girl, æt. 14, had been seized with paralysis of the right arm and leg twenty-two months ago. This lasted a fortnight only, and was followed by paralysis of the left side, then of both, and also by paralysis of the face. The girl was practically well two months afterwards, and the case was diagnosed as hysteria. The paralysis returned three months ago, and was accompanied by symptoms leading to the diagnosis of disseminated sclerosis, in which affection remissions are not uncommon. (2) A slightly marked case of myxœdema, in which the diagnosis had at first been missed, the patient having been treated for Bright's disease. (3) A case of progressive muscular atrophy accompanied with bulbar paralysis. (4) A case of paralysis agitans, affecting chiefly the left side and sparing the head. (5) A case of disseminated sclerosis at an early stage. (6) A well-marked instance of dermography.

Forfarshire Medical Association.—Held in University College, Dundee, *7th October* 1898.—Dr. J. Mackie Whyte, Vice-President, in the Chair.—Dr. M'Gillivray showed a case of paralysis of the right cervical sympathetic, with well-marked symptoms of unilateral anhidrosis, myosis, ptosis, exophthalmos, and heterochromia, probably from an injury to the cervical vertebræ. Dr. M'Gillivray also discussed certain points in connection with the treatment of corneal ulceration.

Professor Stalker read notes of three cases of needle swallowing, and discussed the treatment.

Mr. Greig read a paper on the infectivity of venereal warts, in which he contended that this fourth venereal disease should be recognised. Out of 330 consecutive cases of his own, fourteen were of venereal papillomata, nine of which had absolutely no evidence nor history of any venereal or other local trouble.

Dr. Whyte read notes of a case of tricuspid stenosis in a woman æt. 37, whose trouble had commenced with an attack of endocarditis at the age of 10. Mitral and aortic stenosis developed, and this was immediately followed by the tricuspid lesion, as was shown by the condition of the valves at the post-mortem examination. Dr. Whyte also spoke of a case he had several years ago of pure tricuspid stenosis.

ANALYTICAL REPORTS.

Tidman's Sea Salt and Sea Soap.

Tidman's Sea Salt is so well known that we need only recall its value as a means of reproducing the sea-water baths, which prove so efficacious in the treatment of some cases of chronic rheumatic and gouty affections, at the patient's home, however far from the ocean it may be situated. The soap is sent out as a useful accessory to the salt. It is so compounded that a lather can be produced with the briniest of sea waters; indeed, it may be used in the sea itself while bathing. Used with ordinary fresh water, its contact suggests strong alkalinity. As scent would be superfluous when it was made use of amid the waves of the briny deep, the soap is almost scentless, but it acts very vigorously with fresh water in cleansing the skin from stains of dyes or chemicals, and might find another function apart from use with salt water, in the removal of obstinate stains from the skin.

Brand's Meat-Juice.

(Brand & Co., London.)

Analysis of this meat-juice showed that the statements made by its makers are very accurate. The sample submitted to us yielded, on examination, 59·7 per cent. of water, 40·3 per cent. of solids, with 3·1 per cent. of nitrogen, and 9·97 per cent. of salts, mostly chloride of sodium and phosphates.

Coagulation of the native proteids present, in an unaltered form, by means of heat, or heat along with an acid, results in practical solidification of the whole fluid. As 3·1 per cent. of nitrogen represents 19·3 per cent. of proteid, and as the juice solidifies on heating, much of the 30·33 per cent. of organic material present must consist of albuminous bodies. The presence of unaltered blood pigment in the fresh meat-juice testifies to the fact that the juice is prepared by extraction in the cold, that the preparation is an excellent one, and that it is possessed of high nutritive qualities, as well as being a useful, digestible, and non-alcoholic stimulant.

Harzbach Water.

(Brown Brothers & Co., Glasgow.)

This water is supplied in glass pint bottles, corked and wired. It is freely and strongly effervescent, the carbonic acid gas coming off for some time after the water has been poured out.

The mineral constituents of the water are numerous and form 0·29 per cent. of the total weight when dried at 100° C. They comprise five carbonates, namely, the carbonates of potassium, sodium, lithium, magnesium, and manganesium; the sodium and magnesium in the largest proportions. In addition, the chlorides of potassium and sodium, and the sulphate and phosphate of the latter, are present, along with the sulphate of calcium, ferric oxide, and alumina. The water is pleasant to taste, goes well with spirits, and is one which might well take the place of either plain water, or the ordinary soda and potash waters, for common use at the table of the gouty, the bilious, and the rheumatic. The ingredients are useful, while the water is not surcharged with a superfluity of salines, so often regarded as an essential in curative "waters"; more, perhaps, because they give them a disagreeable taste, and because the nastier the water the greater the virtue, according to many.

Liquor Auri Brom-Arsenatis.

(Arthur & Co., London.)

This solution contains a double salt of gold and arsenic. The bromide of gold and the oxybromide of arsenic, $AuBr_3.AsOBr_2$. Each of the constituent bromides is present as $\frac{1}{32}$ gr. to 10 minims. The preparation is clear, orange-coloured, apparently stable in the bottle. A specimen kept for some time, exposed to diffused sunlight, showed no signs of reduction, while the fact that the drug was sent us in a colourless glass bottle serves to show that it is not markedly affected by light. This liquor can be used by the mouth or hypodermically; but if by the latter method, the needle of the syringe should be made of gold or platino-iridium, as the bromide of gold is easily decomposed by contact with oxidisable substances. The preparation is known by the short title of "Bromaurum"; another preparation manufactured by the same firm, in which mercury is also present, being termed "Hydraurum." Gold in its concrete form is regarded by most men as a universal panacea; internally it has been found to be of considerable service in various forms of disease. The results ascribed to these preparations in the notices sent us appear to be more favourable than the inclusion of the arsenic or mercury can be credited with, and the addition of the gold salt must be looked upon as the favouring agent. The two solutions are elegant products, and, taking their components into consideration, not by any means expensive.

Mistura Calcis Chloridi cum Ferro.

(Arthur & Co., London.)

Another sample sent us by this firm consists of a preparation of lime and iron, both in the form of chlorides. The great feature of the compound, as prepared by Messrs. Arthur & Co., is presented by its practically neutral reaction, and by the absence of sugar. The actual sample tested was amphoter to litmus paper, that is, acted as a neutral body. The makers ascribe to it an acidity of 0·00002 per cent., an acidity which it is hardly worth while differentiating from neutrality. The process of manufacture, which occupies as long a time as three weeks, aims at the removal of the free acid invariably present in solutions of ferric chloride; conjunction of the lime salt with the iron favours this end, leading to an end-product by which a powerful inorganic ferric salt may be administered in a non-astringent form. The very great solubility of the chloride of calcium fits it for the administration with iron in a fluid form, free from the presence of free acid.

MEDICAL NEWS.

Sixth International Otological Congress.

The Sixth International Otological Congress will be held in London, on August 8th, 9th, 10th, 11th, and 12th, 1899. President:—Dr. Urban Pritchard, Professor of Otology at King's College, London. The meetings will be held at the Examination Hall, Victoria Embankment. The subject chosen for special discussion is "Indications for opening the Mastoid in Chronic Suppurative Otitis Media." Communications may be addressed to the Hon. Sec., Mr. Cresswell Baber, 46 Brunswick Square, Brighton.

Two New Professors.

We desire to express our warmest congratulations to the two gentlemen who have recently been elected to the Medical Faculties of Edinburgh and St. Andrews. Dr. Hunter Stewart has by long, zealous, and effective work in the Public Health Department rendered such service to the University that his promotion comes to be simply the natural result of a process of evolution. His successful past can only be regarded as giving the best promise of an even more useful future. Dr. Robert Muir, who leaves the Pathological Laboratory of the University and the Pathological Department of the Royal Infirmary for the Chair of Pathology in the University of St. Andrews, will be followed to his new home with the good wishes of everyone, largely tempered with regret at the great loss which Edinburgh will sustain through his removal. To both of our colleagues we wish to offer our most hearty good wishes.

MONTHLY NOTES ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Five Weeks ending October 1, and for the Year from January 2.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°.	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 2.	Actual.	Accumulated from Jan. 2.	
Mean	52°·8	*[1] 417° [2] 2054°	4° 653°	3·4	22·8	117	1106	2°·47
Observed	55°·48	[1] 471° [2] 2217°	0° 427°	3·3	18·9	148	1170	3°·54
Difference	+2°·68	[1] +54° [2] +163°	−4° −226°	−0·1	−3·9	+31	+64	+1°·07

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland, during September, and since January 2. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Nervous System.		Respiratory System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 904 [2] 9673	160·2 189·5	182 1926	32·3 37·7	81 910	14·3 17·8	110 1116	19·5 21·8	112 1824	19·6 35·7
Actual Deaths and Rate per 10,000	[1] 1106 [2] 9900	195·7 194·0	201 2070	35·5 40·5	103 975	18·3 19·1	138 1154	24·4 22·7	144 1665	25·5 32·6
Difference from Mean	[1] +202 [2] +227	+35·5 + 4·5	+19 +144	+3·2 +2·8	+22 65	+4·0 +1·3	+28 +38	+4·9 +0·9	+32 -159	+5·9 −3·1

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896	[1] 80 [2] 638	14·1 12·5	28 255	4·95 4·99	41 677	9·25 13·2	79 962	14·0 18·7	50 425	8·85 8·3
Actual Deaths and Rate per 10,000	[1] 120 [2] 779	21·2 15·2	22 236	4·0 4·63	72 769	12·7 15·1	84 952	14·8 18·6	52 487	9·2 9·5
Difference from Mean	[1] +40 [2] +141	+7·1 +2·7	− 6 −19	-0·95 -0·36	+31 +92	+3·45 +1·9	+ 5 −10	+0·8 −0·1	+ 2 +62	+0·35 +1·2

* Note.—The figure [1] denotes the data for September, [2] for year to date.

The weather of September was most remarkable. During two successive weeks the thermometer reached 83°, while the week ending 10th September gave a mean temperature of 63°·9, or 10° over the normal; the third week 57°·9, or 5° over. The total increase in the mean temperature for the five weeks is over 2°·5, the last of the series (mean temperature only 49°·3), bringing down the average. The inclusion of the last four days of August causes the figure for the rainfall to almost reach the normal; if the rain which fell on the 30th August be deducted, September shows a deficit of 40 per cent. The figures for the day-degrees show an absolute lack of any below 42°, an excess of 54° of those above it, or over 12 per cent. in excess of the average. The data for bright sunshine affords a 26 per cent. increase in the number of hours over the usual. The mean daily variability of temperature is as much as 1°·07 above that expected.

The year's data afford evidence of a marked increase of warmth and a still more decided lack of cold; a deficit of rain equal to 17 per cent., and an increase in the duration of bright sunlight.

Notwithstanding the unusual meteorological conditions, or perhaps on account of them, the number of deaths recorded in September in the four large towns in the East of Scotland exceeded the mean by 22 per cent. This excess was largely due to fatal cases of digestive diseases, 50 per cent. over the normal; and of pneumonia, 75 per cent. above; while diseases of the circulatory (27 per cent.) and nervous (25 per cent.) systems were also responsible for some of the increase. The only system noted which presents a decreased death-rate is the urinary.

From the commencement of the year the increase in the total number of deaths recorded is almost entirely due to the excessive mortality in September. The digestive system yields, however, a more marked increase, 22 per cent. above the deaths expected during the first nine months of 1898; similarly, deaths from pneumonia are 13 per cent. over the usual figure. The other variations present little change compared with those for August. It is interesting to note that throughout both the present and last year the number of deaths from pneumonia have almost invariably been in inverse ratio to those from diseases of the whole respiratory tract.

Thus the five weeks ending on 1st October were warm, dry (excepting for two heavy falls of rain, almost equalling the total precipitation), bright, but with unusual variations in the temperature values from day to day; but were characterised by a great rise in the mortality, especially in fatalities from digestive diseases, and in deaths from pneumonia; the latter item following closely the variability of temperature value.

For the year the warmth and drought has had the effect of increasing the total mortality, but of lessening that due to respiratory diseases apart from pneumonia.

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ORIGINAL COMMUNICATIONS.

ON SURGICAL INTERFERENCE IN GYNÆCOLOGY.[1]

By J. Halliday Croom, M.D., F.R.C.P.Ed., F.R.C.S.Ed., F.R.S.E.,
President, Obstetrical Society; Physician, and Clinical Lecturer on Diseases of Women, Royal Infirmary, Edinburgh.

For the second time in my life you have done me the honour of placing me in this chair, and, however unworthy I may feel of this renewed exhibition of your favour, I can only, in what remains of my term, throw myself unreservedly on your generosity, and do my best, however little that may be, in some small way to acknowledge the distinction you have conferred upon me.

Alas, such a compliment at your hands only, unfortunately, too vividly reminds me

Tempora labuntur tacitisque senescimus annis.

Gentlemen, this is the sixtieth session of our Society, and we can look back with satisfaction upon hard, steady work, enlightened here and there by no mean examples of genius, and certainly by many brilliant additions at once to the literature and the science of our department.

Originating under the exceptional brilliance of a Sir James Simpson, at a time when the discovery of anæsthesia marked an epoch in the history of medicine, our Society has gone on adding, little by little, month by month, to the development of our knowledge of obstetrics and diseases of women. And you must remember that with Simpson, and with this Society, the science of gynæcology, as far as Scotland is concerned, began. He was the pioneer of this department, and from him gynæcology got its first impetus. And in this Society, with that impetus gained from him, it has enormously developed, and so flourished that I may say, without presumption, that our Edinburgh School of Gynæcology has acquired an enviable prominence in the history of medicine.

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[1] An Inaugural Address to the Obstetrical Society of Edinburgh.

Other societies there have been, which, combining medicine and surgery in all their branches, have met regularly, contributing to every sphere of medicine, but I venture to believe that there is no society in Scotland which has persistently met month by month, often fortnight after fortnight, and which, drawing its life from a special and comparatively small department, has lived and flourished as ours has done.

In looking back over the work of this Society for the last ten years, it is interesting to find that it has well preserved its name of "Obstetrical," for the papers communicated during that period have been more than twice as many obstetrical as gynæcological. And it is well that it is so, for it must be remembered that the Society originated when obstetrics was a science and art, while gynæcology was practically unknown. Since those days, gynæcology has expanded into a science, it might almost be said, a science of its own. Indeed, it is not going beyond the mark to say that gynæcology has made such progress since those days that it has been divorced altogether from obstetrics, and has become a separate and distinct department. The so-called "obstetric physician" of our younger days, known as an important officer of every great hospital, has ceased to exist as such, and now he who would aspire to the charge of diseases of women in a general hospital must be a "gynæcologist," and *ipso facto* a surgeon. Thus it seems to me that the department of diseases of women has trended away, by easy gradations, from the domain of medicine into that of surgery, and gynæcology and obstetrics have become two distinct departments. The obstetric physician must be relegated to the lying-in hospital, while the gynæcologist must be classed among the surgeons of a great hospital.

The therapeutics which thirty years ago held their sway over this department no longer occupy the all-important place they once did; and diseases of women have drifted away absolutely and entirely from the domain of the physician into that of the surgeon pure and simple.

No doubt this is to some extent natural. The development of abdominal surgery within the last thirty years has been so startling and phenomenal, that no wonder men have devoted their lives and their time to the perfection of this particular branch. The operation of ovariotomy is itself a striking example, and there can be no doubt whatever that, with the present generation, the *rôle* of the ovariotomist pure and simple exists no longer. Now, that operation which is as safe as any other major operation in surgery, has, thanks to the obstetrician first and to the gynæcologist after him, become an operation as much in the province of an ordinary surgeon as a hernia or a gastrostomy. But it must be kept in mind that this advance is due entirely to our department.

It must ever be, however, and will ever continue to be, a difficulty with the surgeon who is not accustomed to either obstetrical or gynæcological work, to make his diagnosis a certainty, and therein will always lie the crux with the surgeon when he takes pelvi-abdominal work in hand. This question of diagnosis brings us at once back to the domain of the obstetrician, with whom the diagnosis of pregnancy, for example, is part of his daily work, whereas the general surgeon has not the opportunity of perfecting himself in the differentiation of such conditions.

Now, this divorcement of diseases of women from obstetrics is not altogether without its disadvantages. The pendulum has swung, and swung very markedly, to surgery. That to surgery gynæcology has owed its greatest victories there can be no question at all. One has only to think of the improvements in abdominal hysterectomy, and its fullest development in panhysterectomy, with, on the other hand, the conservative operation of myomectomy. These all are recent triumphs of the surgeon's art. Further, the last decade has witnessed remarkable improvement in the treatment of diseases of the uterine appendages. For while, no doubt, the removal of ovaries and tubes for inflammatory diseases has been enormously overdone, yet our experience has now crystallised our knowledge with regard to the pathological conditions for which these structures can be conscientiously removed. We cannot be too glad to recognise that the tendency now is becoming more and more conservative, and that the perfected methods of antiseptic surgery enable us to deal with even limited areas which are affected in ovaries and tubes which are not entirely diseased. The ease and safety with which complete salpingo-oöphorectomy can be performed must ever be a reason why we should safeguard this operation as much as possible; and fortunately we are now in a position to realise that only in grave pathological lesions should these organs be entirely removed. Those of us who have been in the habit of dealing with morbid pelvic conditions, must have become impressed with the fact that removal of the ovaries for merely inflammatory conditions is by no means a uniform relief to the symptoms, and often has grave and serious effects upon the patient otherwise.

Of tubal affections none can be more important than tubal pregnancy; and the treatment of extra-uterine gestation has become, within the last fifteen years, one of the recognised triumphs of gynæcological surgery. The means of dealing with a tubal pregnancy before rupture are quite well determined, and its removal is a matter of comparative safety compared with the risks of rupture. But even after rupture has taken place, it can be, and often is, dealt with quite successfully. The difficulty in dealing with extra-uterine pregnancy will always be one of diagnosis.

But even here, great and pronounced as the surgical advance has been, it is just possible that, in dealing with extra-uterine pregnancies, especially early ones, the resort to the knife has been overdone, and many early ectopic gestations, even after rupture, have absorbed and disappeared without the arbitrament of the knife.

In pelvi-abdominal surgery by the vaginal route the advances have been no less remarkable. The dealing with uterine cancer by the entire removal of the uterus per vaginam has developed enormously within the history of the Society. The operation can now be done in a few minutes; and that this indicates an enormous advance in technique, it is impossible to deny. But the question comes to be, does the operation, so shortened and so simplified, tend much to the prolongation of life of the patient? It certainly has made the removing of a cancerous uterus a simple and easy procedure, even in moderately advanced cases. But I doubt if it has done much, if anything, to prolong the life of the patient, or to ameliorate her sufferings; and for this reason, that the disease, after hysterectomy, proceeds rapidly to the peritoneum, where it produces for the patient sufferings and a death worse than if no operation had been done at all.

That a vaginal hysterectomy stops hæmorrhage and fœtid discharge and relieves pain, there can be no question at all. But this is only a temporary improvement. And for this dire disease even a temporary alleviation of these symptoms would be an advantage, were it not that, with the recurrence of the disease, the ultimate pain and suffering are greater than if it had never been touched at all.

Here and now it is not my business to discuss whether cancer begins generally or locally. The great pathological warfare of twenty years ago, between Paget and Hutchinson, remains still unsettled, but I believe the consensus of opinion is in favour of the view that it is primarily a local disease which later attacks surrounding and distant parts, and infects the system generally. If this be so, of course the argument for removing the uterus, when it is the centre of the infection, remains as strong as possible. And, naturally, if the gynæcological surgeons were able to see the cancerous uterus at its initial stage, and remove it, no doubt good results ought to be anticipated. But such is, unfortunately, not the case.

After an experience now of twenty years, including twelve years as physician in the Royal Infirmary, I have tabulated every case that has come under my special supervision. They amount to 260 cases. It is twelve years ago since I did my first vaginal hysterectomy for cancer. That operation lasted two hours and a half, and, as a proof of the advance in technique and of the ease with which the operation can now be performed, the last I did was performed in eighteen minutes. I have diligently observed every case of malignant disease of the uterus that has come under my observation, with a view to the performance of that operation, and of the 260 cases only fourteen have fulfilled all the conditions requisite to justify hysterectomy with expectation of success. I have carefully operated upon all of these cases. All the operations have been undertaken with the assistance and approval of my colleagues; and here and now I wish to say, speaking the absolute truth, that these fourteen patients on whom hysterectomy was performed—although they all, to use the ordinary hackneyed phrase, made absolutely uneventful recoveries—died every one of them within the year, and, in my opinion, with greater suffering than if they had been left alone.

Now this applies, unfortunately, to several cases in which the disease was absolutely confined to the fundus, and where, so far as I could find, there was no involvement of the broad ligament whatever, these cases being typical examples of the desirable cases on which to operate. And yet in all the disease recurred in the peritoneum and the patient died in great distress within the year.

Now, given that the diagnosis of cancer is made at its most initial stage, with due care and attention a woman's expectation of life may be from two to two and a half years, I ask, with the best statistics available, whether she has a better prospect if the cancer be left alone or if it be interfered with by hysterectomy. Many forms of cancer are painless. Most of them destroy life through hæmorrhage, exhaustion, and uræmic poisoning, etc. The question is, Do women live longer lives and die less painful deaths if the uterus be removed, or if the disease be allowed to run its ordinary course? For my own part I do not think that surgical interference is the better.

I know well that I shall be confronted with the German statistics. It is not becoming in me to question these statistics; but I do not think that either this country or America, whatever the explanation may be, has given us results at all in comparison with what the Germans claim. For example—at the end of five years Fritsch had 36 per cent. of cures; Hofmeier, 33 per cent. after four years; Schauta, 47 per cent. after two years. At the Dresden clinique, of eighty patients examined two years after operation, forty-five had no recurrence. Of fifty-eight examined after three years, 58·6 per cent. were well. Of forty-two patients after four years, in 59 per cent. there was no recurrence. Of thirty after five years, 60 per cent. were well, whilst two survived seven years. Leopold states, what seems to me the most startling statement in surgery, that out of seventy-six cases seventy-two were well and without recurrence after one to five and a half years.

If these figures are true—and I have no desire to traverse them—I can only say that cancer in Germany must be one thing and cancer in Great Britain another; that the respective diagnostic skill of the two countries must vary considerably, or that women must present themselves to the German surgeons at a period when the disease is in its most initial stage, when it is still confined to a small nodule in the cervix, or limited to the mucous membrane of the fundus; for I cannot conceive that results such as I have referred to are obtainable after the disease has advanced, where the lymphatics and glands are involved, or still less when the uterus has become fixed.

The opportunities of the Edinburgh Infirmary and of private practice give us, alas only too ample scope for seeing and diagnosing cancer, and my own sphere of experience has been a reasonably large one; and I repeat that, in all these years, fourteen only have been seen early enough to render a successful issue probable, and these have died within a year of operation. As a further explanation of the discrepancy, may I venture to suggest, without multiplying examples, that within my own personal knowledge cases of marked cervical catarrh with gross erosions have been regarded as cervical cancer and removed as such; and it is very easy to mistake an advanced senile uterine catarrh of a pronounced type for a fundal cancer. In my own cases I need hardly say that, before operation was undertaken, in each of them the suspected tissue was examined microscopically and the diagnosis thus absolutely established. It is true some gynæcological surgeons tell us that, as the senile uterus is of no further use, when there is any doubt it is better removed; and, for example, they will tell us further that, after removing the ovaries by the vaginal route, the uterus may as well also be removed for the same reason,—but, I ask you, is this surgery? The ablation of an organ because it is of no further use is no argument; the point in surgery, so far as I see, is only to remove those organs, or those portions of organs, which are absolutely diseased, and which shorten life or are seriously interfering with health. The conditions to which I have just referred do neither.

Further, if we take and carefully look over these statistics, we shall find that they are, to say the least of them, somewhat ambiguous. And we shall further find that, even though a woman lives two years after the operation and has no return, it is doubtful whether she lives longer and dies happier than if the uterus were left *in situ*.

The whole point of the matter is this, that it is quite conceivable that, with a cancer very early diagnosed and operated upon, the prolongation of life is possible, although unfortunately such has not been my experience; but, after a cancer has developed beyond its most initial stage, I hold and believe that the removal of the organ does not prolong life, and that the subsequent death is infinitely more terrible.

Now, if the disease be local in its origin, and only affects the system secondarily, one naturally asks why the alleged results are so satisfactory in the mamma and, apparently, so unsatisfactory in the uterus. The answer seems plain. It is the old question of early recognition. And the possibilities of early recognition in the mamma and in the uterus are totally different. Every woman recognises a small swelling in her breast at once, and seeks for immediate advice, whereas a woman may have uterine discharges, leucorrhœal and even hæmorrhagic, and pain and discomfort for months, without taking any notice of it whatever. If it were possible to recognise early cancer in the uterus as well as in the mamma, of course it is possible, as I have just said, that the results would be somewhat better. Furthermore, we must remember that whereas in the breast the lymphatic connections and glands can be dealt with, and are regularly dealt with, whether they appear to be affected or not, it is otherwise in the pelvis. And perhaps Howard Kelly, acting on Freund's suggestion, may be in the right lines in giving up vaginal hysterectomy for cancer, and dealing with the whole uterus and broad ligament from above. But this procedure is, to say the least of it, still *sub judice.*

Since Freund, in the late seventies, first of all introduced abdominal hysterectomy for cancer, and afterwards abandoned it because of its high mortality—somewhere about 76 per cent.—vaginal hysterectomy in the hands of Fritsch, Leopold, Landau, Martin, Olshausen, Doyen, etc., has undergone a varying course of evolution, until now the operation is as perfect as it can be, and the immediate mortality, which at first was 15 to 25 per cent., has fallen to practically *nil* even in my own hands. But I wish to point out that records such as appear from time to time in our journals, of successful cases of vaginal hysterectomy for cancer, mean absolutely nothing at all, because to give a series of tables of successful hysterectomies, winding up with the stereotyped phrase, "the patient left the hospital well," is no addition to our knowledge of results. The operation has been so improved that anything less than a successful immediate issue would be scarcely warranted. No one for one moment would dream of detracting from the merit attaching to those eminent surgeons who have so improved and evolved the technique of the operation, and rendered it, so far as its immediate results are concerned, an absolutely safe one; but much though we may admire that, and heartily give them every meed of praise, yet we must look beyond the immediate present to the no distant future of the operation; and from dealing with the names of the eminent men, to whom I have just referred, I am bound, as a humble worker in the department, so far as it is of any interest to the Society, to descend to myself and state my own experience.

Some of us have lived long enough to observe and note how various operative interferences have come into vogue, flourished, and died.

Far be it from me to decry operation. I have myself opened the abdomen for one reason or another upwards of 1000 times, therefore I cannot be classed among the non-operating gynæcologists; but, on looking back over a considerable experience, I am unable to recall much benefit that has accrued from surgical interference as far as the cancerous uterus is concerned.

That the subject of cancer should have occupied the best minds of the greatest men is not a matter of surprise. When we consider the hopelessness of the disease, and the pain and suffering which are its invariable accompaniments—this, I say, is not a matter for surprise. Still less do we wonder when we think of its extraordinary prevalence. After mammary cancer, the uterus is by far the most frequent seat of the disease in women. I believe I do not overstate the case when I say that at the present moment there are at least 8000 women—probably a great many more—suffering from uterine cancer in the United Kingdom.

For, rely upon it, there is no more pressing subject; for it seems to me that, in our efforts to cure or ameliorate cancer, we have come against a dead wall. Whether it is possible that we may have got a suggestion in removal of the ovaries for the cure of inoperable mammary cancer, and whether the same operation may offer a possibility for uterine cancer, remains a moot question. It is also possible that the solution may still be found, in treatment by some animal extract or on the antitoxin principle, which has been found so valuable in diphtheria and tetanus.

Nothing, certainly, can be more remarkable than the accidental discovery of what has proved a most marvellous remedy for myxœdema, in the treatment by thyroid extract. And, in our own department, we have a similarly striking example in the accidental discovery and development of the results which follow upon removal of the ovaries in cases of osteomalacia. For our knowledge of this question we are much indebted to one of our own Fellows, Dr. James Ritchie. Whether this condition be due to zymotic influences, to reflex nervous phenomena, to dietetic causes, or to altered chemical changes, the fact remains, that many cases have been recorded in which a cure has been obtained by oöphorectomy. In our groping for light as to a malady which is in itself absolutely fatal, and which, I fear, according to recent statistics, is increasing, it is our duty to keep an open mind for any theory, and to welcome any suggestion, however extreme, in dealing with this awful disease.

While at the present day every surgical proceeding is accepted and adopted, it is striking to think how medical innovations are received with distrust. Even anæsthesia, that has revolutionised the whole of medicine and surgery, was, on its first introduction, scorned, and regarded in the light of charlatanism.

It is interesting now to look back after this interval of time, and to reflect how this wonderful discovery, associated as it is so intimately with the founder of our Society, was received in England. It is best told in the late Sir Russell Reynolds' own words:—

"The first operation in England performed under an anæsthetic was witnessed in University College Hospital. Liston had consented to try the anæsthetic. "I can see him," says Sir Russell Reynolds, "as he said to the students, 'Gentlemen, we are going to try a Yankee dodge for making men insensible.' At length Peter Squire said, 'He is quite ready now, sir.' Liston's knife flashed in the air. I took out my watch to count the time, and the leg was on the floor in twenty-six seconds. Liston turned to the students, and said, "This Yankee dodge, gentlemen, beats mesmerism hollow." Such is Russell Reynolds' report.

The great discovery had to make its way against obstinate prejudices and folly, and Liston's grudging utterance should serve as a warning to those of us who make light of new methods, only because they are new.

Looking back over thirty years' experience,—from the escharotic treatment, the chian turpentine epoch, the various amputations, curettings, and hysterectomies,—I am rather disposed to think that the surgical method of dealing with uterine cancer has done little either to ameliorate suffering or to prolong life, and that once a uterine cancer is recognised, palliative local measures and a happy euthanasia through morphia are the best solutions of the difficulty.

Such a statement may have the verisimilitude of despair, and, so far as I personally am concerned, that is my position. I hope and trust that the day may yet dawn when we shall have measures, whether therapeutic or surgical, of dealing with uterine cancer effectively, but I confess that I do not believe it has dawned yet.

Perhaps these statements are somewhat at variance with the gist of the address I had the honour of making, as President of the section of Obstetrics, to the British Medical Association some years ago. Then I was captivated with the wonderful improvements made in the technique in the operation of vaginal hysterectomy by Doyen of Paris, and introduced to us here, especially by Professor Simpson.

Unfortunately, so far as my own personal experience has been concerned, improved technique has not bettered my results. For the last series of cases have all been done with this enormous advantage, but without any improvement in the ultimate result.

I have honestly stated my own experience, and I shall be only too pleased if, whereas my work reads failure, the results of the other Fellows of this Society give a more optimistic view of the case.

You will perhaps say to me that I have taken undue advantage of my position here to discuss a question of enduring interest from my own side, and in this way avoid due criticism. But this is not so, for I hope to place before you the whole of my cases in detail, at no far distant date.

With regard to hysterectomy for conditions other than cancer, such as prolapsus, subinvolution, and inflammatory disease of the uterus and appendages, the operation is one which, from its simplicity, requires to be safeguarded. Like the removal of the uterine appendages for inflammatory disease, this operation bids fair to be overdone. Unlike uterine cancer, none of these diseases are in themselves necessarily fatal, and the symptoms and discomfort to which they give rise can in many cases be alleviated by other less drastic measures. I am free to admit that there are cases for which the operation offers perhaps the best prospect of cure, such as small bleeding fibroids and prolonged hæmorrhages from the uterus which have resisted all other means of treatment, but such, so far as my own personal experience goes, are comparatively rare.

With regard to fibroids, removal of the ovaries for bleeding or rapidly growing tumours is gradually being supplanted by the operation of abdominal hysterectomy, an operation much more certain in its results, though more dangerous for the moment. This operation had at one time such an alarming mortality as to be quite deterrent. Even yet the death-rate is most undesirably, and perhaps needlessly, high, and it is an operation which, except in the hands of experienced operators, is not to be undertaken without considerable anxiety.

The improvements in this operation have been no less remarkable. The ligature of the broad ligaments and uterine arteries, the substitution of the intra- for the extra-peritoneal stump, the complete removal of the whole organ by pan-hysterectomy, and the remarkable results obtained by both foreign and British operators, make this a more thorough and reliable method of dealing with these growths than any. It is further possible, in most cases, to have recourse to this operation when the safer and simpler operation of removing the ovaries has failed to give the desired relief.

In a large number of cases, especially when the tumour is of considerable size, removal of the ovaries is an impossibility, and hysterectomy is the only means of dealing with them. We now recognise that the inconveniences and dangers of fibroid tumours do not by any means cease with the menopause; but I must say that I have no sympathy with the indiscriminate removal of these simple tumours, and I can never conscientiously advise a patient to undergo the risk of hysterectomy, unless urgent symptoms, such as rapid growth, mechanical pressure, hæmorrhage, or malignant degeneration (which is itself a curiosity) present themselves.

In conclusion, while we can look with reasonable pride on what our Society has accomplished in the past, through your kindness it falls to me once again, as your president, to remind those of you who are amongst our comparatively younger Fellows, that the future—here an almost limitless one—lies wholly with you, a future which I believe is secure in your hands. Your pathways must lie, I believe, in a middle course between the *nimia* *diligentia* of the surgeon and the somewhat tardy methods of the physician. One thing must be for ever abnegated, and that is self. The atmosphere and condition of your work is favourable and congenial, for, in whatever else we may be as a department wanting, we may congratulate ourselves on this, that our work is free from the contention of petty personal jealousy, and is directed in its sole aim and object to the advancement of science, which, aright translated, reads—the alleviation of human suffering.

ON THE RELATION OF THE NERVOUS SYSTEM TO DISEASE AND DISORDER OF THE VISCERA: THE PATHOLOGY OF VISCERAL INNERVATION.[1]

By Alexander Morison, M.D., F.R.C.P.Ed., *Physician, Out-patients, Great Northern Central Hospital, and Children's Hospital, Paddington Green, London.*

When the founder of this lectureship first conceived the intention of proposing its establishment, which was, I believe, many years before that actually took place, there were, I understand, few if any systematic courses on psychological medicine in this country. I have seen it stated, indeed, that he was himself at one time the only systematic and special lecturer on the subject in Great Britain; and although he had large opportunities for teaching the subject practically, I understand he evoked a very tepid enthusiasm in the matter, and that his classes were never so large as the importance of the subject and the prevalent ignorance of it, at that time, would have rendered desirable. Novel subjects in a curriculum only attract the more prescient students. It is of interest to know that the now veteran head of our profession, Sir William Jenner, was one of the few students who attended the lectures in question.

As, therefore, this lectureship was originally intended to supply in a measure the want of systematic teaching, it was agreed that a considerable number (six) lectures should be delivered annually. Now, however, that psychological medicine is more generally taught, and has acquired an acknowledged importance, which is but an adumbration of its future pre-eminence as a branch of medicine, the *raison d'être* of this lectureship is not quite the same. It has become, like some cognate foundations elsewhere, a means of bringing before the profession the work of individual lecturers, and what is newest and most important in the work of others in connection with the theme proper to the foundation. But original or new work is an exhaustible quantity, and to spread it over a prescribed number of lectures might be difficult, perhaps tedious, especially to the audience, and certainly unnecessary. The delivery of a smaller number of lectures annually, therefore, than was originally contemplated, would seem to be to the advantage of all concerned. I think I am correct in assuming that this is the conclusion at which the College has arrived as regards the character of this lectureship and the duration of the individual courses.

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[1] The Morison Lectures, delivered before the Royal College of Physicians, Edinburgh, November 1898.

In selecting, therefore, so large a subject as the relation of the nervous system to visceral disease and disorder, I need scarcely state that I had not the presumption, in view of the audience I should have the honour of addressing, to entertain any intention of an exhaustive treatment of material, concerning which many of my hearers would be in a position to be, as some of them possibly have already been, my teachers; but rather to indicate, so far as I could, guiding points in a subject of increasing interest and importance; to endeavour, in short, to discover principles—*principia*—those light rays of the dawn, the first perception of which, in obscure surroundings, is one of the most exalted pleasures of which the human mind is capable.

In considering some features in the anatomy and physiology of the visceral nervous system, in this place last year, the method pursued was centripetal,—we examined the subject from the so-called peripheral nerve-endings in organs to their known or surmised origin in the intermediate or central portions of the nervous system. In referring to some points in the pathology or pathological physiology of the same structures, I propose following the same course.

The pathology of the visceral nerve-ending may be frankly stated to be non-existent, although it may legitimately be assumed to participate in the disintegrative changes which may affect visceral nerve-trunks, and to which I shall presently refer. We have seen how difficult it is in many cases, and under the most favourable circumstances as to freshness of tissue, to detect the nerve-endings in the viscera, anatomically; and when we remember that some of our best histological methods, such as the chrome-silver methods, are not at present well adapted for pathological work, and that such investigations themselves require an amount of time which is not at the disposal of many general pathologists, it need not surprise us that the pathological changes in the nervous periphery are still in great measure a *terra incognita.* The recent tendency of physiological thought, moreover, to rob the peripheral nervous system of the very modest amount of subordinate autonomy claimed for it, is calculated to delay active research in this direction. When, however, the inevitable period of reaction against too narrow a Hallerism sets in, and our histological methods for pathological purposes are extended, we may expect the same new life to be infused into the investigation of the peripheral nervous system, which a better knowledge of the fine anatomy of the nerve cell has already called forth in the examination of the obscurer changes in the cell protoplasm of the central nervous system.

The visceral nerve-trunks, as we determined on a previous occasion, are spinal or sympathetic and vagal or non-sympathetic; although the root and trunk ganglia of the par vagum appear to constitute a compromise between the character of the non-visceral or somatic and the visceral spinal nerves.

The disintegrative changes in the visceral nerve-trunks may be broadly regarded as of an active and passive kind, the former being due to organic or inorganic poisons, and the latter to slow or rapid solutions of continuity by pressure or grosser traumatism. The organic poison playing the part of a morbific agent may be introduced, or of home growth; it may be heter-intoxicant or aut-intoxicant. The heter-intoxicant organic poisons most frequently operative are alcohol and the infectious or contagious fevers, especially diphtheria; the aut-intoxicant, some form of caco-metabolism, such as diabetes or gout. The most common inorganic poisons which are of necessity introduced and heter-intoxicant are lead, phosphorus, arsenic, and mercury.

The specific effect which these poisons have upon the peripheral nervous system is to cause a proliferation of the connective tissue of the sheaths and of the nerves themselves, and thus, apparently by the accumulation of adventitious products, to disturb the nutrition, impede the conductivity, excite in sensory nerves the sensibility, and ultimately to destroy the continuity of the axis cylinders of the affected structures. This process produces, in short, an acute tumour, which rapidly invades the structure, eliciting in some cases its responsive properties, and finally abolishing the latter. Fortunately, the cessation or withdrawal of the morbific agent, and the reparative power of nerve tissue drawing its life from a higher source, serve, on the removal of the proliferant and disintegrative blockage, to restore the nerve in many cases to its pristine activity or to a state of sufficient functional power.

These well-known features of peripheral neuritis in general have also been found to apply to the visceral nerves; although, having to deal in this case with structures differing largely in important anatomical particulars from the somatic series, there would appear to be some modification of the process in the internal organs, and the whole subject still constitutes one of the fruitful fields of future pathological research.

Paul Meyer,[1] in his account of one of the most carefully examined cases of diphtheritic paralysis with which I am acquainted, found the degenerative changes referred to well marked only in the coronary of all the visceral plexuses. The pulmonary and gastric plexuses were doubtfully implicated, and the semilunar ganglion

[1] *Virchow's Archiv*, Bd. lxxxv. S. 181 *et seq.*

and sympathetic system generally showed no distinctly pathological alterations. He concluded that the fibres involved in the coronary plexus were probably of vagal origin. The clinical visceral phenomena of diphtheritic poisoning, although in their most tragic form frequently associated with cardiac failure, are not, however, as we know, restricted to that organ, and it is probable that like changes occur especially in the medullated nerves of other viscera. The severe pain of lead colic, which Ross[1] considers neuralgic, as well as the agonising enteralgia associated with specific and old malarial poisoning in some cases, point to an irritative neuritis of sensory visceral fibres.

The difficulty of detecting changes in the sympathetic system, as a whole, is doubtless due, as some have remarked, to the preponderately non-medullated character of the nerves in question. The sensory nerves in the distant periphery are, however, according to Kölliker, usually medullated,[2] and in these the alterations attendant upon degeneration ought to be capable of detection.

The more gradual pressure exerted upon nerves by morbid growths, while it is conceivable that in some cases it may induce neuritic changes, similar to those already referred to, may, by the slow obliteration of nerve-paths, produce a disintegration more allied to the well-known consequences of nerve section, in which the disintegration of the medullary sheath is more general and associated with a minimum of thecal proliferation. Martius, in his monograph on tachycardia,[3] refers to a case of Hayem's, in which pressure by a sarcomatous tumour in the mediastinum induced atrophy, with fatty granular degeneration of the myelin sheath in both vagi, and likewise mentions a case of Billroth's, published by Kappler,[4] in which that distinguished surgeon excised a portion of the right vagus nerve in a man, without permanent effect upon his heart's action, but with persistent paralysis of the laryngeal muscles innervated by the cut nerve, which doubtless exhibited the sectional disintegration of which mention has been made, although this is not expressly stated by Martius.

Such processes destroy the activity of visceral nerves, and are distinctly destructive, death-dealing, or pathological. The increased demand made upon the functional activity of an organ, from break-down in a system of which it is part, such as the demand made upon the muscular power of the heart when the circulation is from any cause rendered more difficult of maintenance, may, however, be regarded as constructive, life-giving, and physiological, although the organ manifesting compensatory power cannot be regarded as a typically normal one.

It has appeared to me to be permissible and a matter of sufficient interest to again examine a question which has already occupied the attention of some whose names will ever be held in honour by us. I refer to the relation of an hypertrophied organ to its nerve supply. A study of affections of the heart has impressed upon me the importance of this subject, and I have chosen the uterus as the organ manifesting greatest variation in physiological bulk, as that best calculated to furnish data for the determination of the question, although, as I shall remark later, both this organ and the heart have intrinsic peculiarities not altogether shared by organs which do not possess the same range of rhythmical variation in capacity.

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[1] "Diseases of the Nervous System," vol. i. p. 738.

[2] Gewebelehre, Bd. ii.

[3] "Tachycardie. Eine klin.-Studie," 1895, S. 68.

[4] *Arch. d. Heilk.*, Leipzig, 1864, S. 271.

William Hunter appears to have been the first to "suspect"[1] that the nerves of the gravid uterus were enlarged in proportion to the vessels. John Hunter[2] disputed this assertion, and declared himself an unfaltering Hallerist, so far as the nerves were concerned. "The uterus in time of pregnancy," he writes, "increases in substance and size probably fifty times beyond what it naturally is; and the increase is made up of living matter which is capable of action within itself. I think we may suppose its action more than double, for the action of every part of this viscus at this period is much increased, even beyond its increase of size, and yet we find that the nerves of the part are not in the smallest degree increased. This shows that the nerve and brain have nothing to do with the action of the part."

The matter seems to have been regarded as more or less debatable, until the acceptance, by a considerable number of leading men, of the published results of Robert Lee's work.[3]

Lee, who asserts that William Hunter never dissected the non-gravid uterus, maintained from his own dissections that these "prove that the human gravid uterus possesses a great system of nerves, which enlarges with the coats, blood vessels, and absorbents during pregnancy, and which returns after parturition to its original condition before conception takes place." As we know, a very bitter controversy took place over this question, and called forth a flood of private correspondence, much of which Lee published. In one of these letters, Robert Knox, the Edinburgh anatomist, while agreeing with Lee as to the nature of the structure in dispute, considers that the question of the increase of the nerves in size had been exaggerated.

In more recent gynæcological literature the matter is not referred to very frequently, but Galabin's position may probably be regarded as that of the majority of authorities in that department of medicine. "It is now established," he writes, "that, as might have been expected, growth does takes place in the nerves, including the so-called 'ganglion cervicale uteri,' to fit the uterus for the process of labour, in which both reflex action and periodic centric discharge of nervous energy play important parts."[1]

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[1] "Anatomical Description of the Human Gravid Uterus," London, 1794, p. 21.

[2] "Works," Palmer's edition, vol. iii. p. 117.

[3] *Phil. Trans.*, London, 1842, pt. ii.

The question, it will be gathered, was one not easy of determination, and also eminently calculated to be embarrassed by the influence of preconceived notions. Lee himself showed how, by laboriously picking off all connective tissue surrounding the nerves, their apparent size could be greatly reduced; and, valuable as his work was in many respects, it is probable that he rather overestimated the increase in the size of the nerves in the physiologically active organ.

As I have already stated, Lee asserts that William Hunter never dissected the non-gravid uterus, and could not therefore have been in a position to institute a comparison. That great man, however, as I have also stated, merely expressed a suspicion. The method of Lee, moreover, was open to fallacy. The ganglion cervicale uteri is not an unyielding structure, and a good deal of adventitious tissue surrounds extra-organic nerve-trunks. Nerves and ganglia can be flattened without notable intrinsic overgrowth.

ADVANCED PREGNANCY.	Cervix.	Level of Bicornu.	Body.
Fœtus nearly fully grown.	8–10 microm.	5–10 microm.	6 microm.
EARLY PREGNANCY.			
Fœtus measured 1·5 mm.	8–12 ,,	10–12 ,,	3–4 ,,
Twenty-two days post-partum.	7–10 ,,	5–7 ,,	5 ,,

To avoid these sources of fallacy, I resolved to examine the nerves of the uterus at various stages of pregnancy, by transverse sections of its lower segment where the nerves are largest, and by longitudinal section and other means, the body of the organ where the nerves naturally are diminished in size and less easy of detection, and comparative measurement on transverse section. Sections of the lower segment were stained with hæmatoxylin in the usual way, while the nerves of the upper portion were examined by Sihler's method, which I described last year. The animal used was the cat; and as I altogether failed to discover an adult animal which was not more or less pregnant, one was kept for twenty-two days after parturition, to allow of the uterus regaining its non-pregnant size, and was accepted as the type of that condition. The animals were killed before examination by chloroform, hydrocyanic acid, and by drowning, after having been anæsthetised.

In gauging the size of the nerves at a given level, the largest nerve visible was sought as that most easy of detection and least liable to erroneous observation.

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[1] "A Manual of Midwifery," London, 1886, p. 97.

A large number of sections were made and examined more or less carefully. The general impression conveyed by these to my mind is reproduced in the micromillimetric measurements actually made, as shown in opposite page.

As I have stated, only the largest measurements were taken. Below these, every size of nerve, down to the terminal fibrils and penultimate plexuses, were observed, and to peculiarities of the latter I shall have to return when discussing visceral pain in the next lecture. The present observations on the relation of size of nerve to hypertrophous organ were indeed made *en passant*, the research being directed more to the elucidation of the local causes of visceral pain, with a view to the discussion of the etiology of angina pectoris. In estimating the value of the measurements given, three questions have to be answered—(1) Were the animals the same size? (2) Were all the measurements taken from uterine nerves proper? (3) Do the comparative sizes given in the three animals represent corresponding levels?

The first and second of these questions I answer in the affirmative. The third requires some explanation as to the diameter of the nerve from the body of the uterus post-partum. The body of the uterus in this condition being smaller than in early pregnancy, and much smaller than in advanced pregnancy, the whole of it was sliced with Cathcart's freezing microtome prior to staining; and it is possible that the nerve of comparatively large diameter, noted as the largest seen in this case, may have been obtained from the body of the uterus at rather a lower level than the mid-body—the portion examined in the other cases—and thus be somewhat of an over-estimate for the non-pregnant state.

An examination, however, of the diameter of nerves in the cervical portion of the uterus leads to the conclusion that, while there is practically no difference between the size of the uterine nerves in advanced and early pregnancy, there is a certain increase of size to be noted in these conditions, as compared with those in the quiescent uterus twenty-two days post-partum; and it may therefore be validly assumed that what is true of one part of the organ is true also of the whole, and that some increase in the apparent size of the nerves in the gravid as compared with the non-gravid uterus may be conceded. The increase is, however, I believe, apparent rather than real, for a closer examination of the individual fibres constituting the nerve-trunks reveals no increase in them, either in size or numbers. What may, however, be observed is, a somewhat greater pliability and looseness or succulence of texture; the bearing of this upon the remarkable condition I shall presently refer to will be apparent. It may therefore be safely asserted that, if any increase takes place in the size of the nerves of the gravid uterus, it is in no sense proportionate to that which is by common consent met with in the case of the vessels, muscular fibre, and connective tissue constituting the organ.

Lee states that John Hunter left no preparations of the uterine nerves, in support of his assertion that there is no increase in the size of the nerves of the gravid uterus. That matchless observer, however, left a positive assertion of an observable condition, and it requires some boldness to call in question the accuracy of his observation. Personally, I respectfully tender my adhesion, with the qualifications already stated, to John Hunter's statement as regards the condition of these nerves in pregnancy. But the difference between a statement of facts in an observable condition, and the expression of an opinion, however positively made, which is not covered by those facts, is very considerable. Science knows no *ex cathedrâ* utterances, and the humblest who can draw from the bosom of nature an indubitable fact, which contravenes the opinion of the most exalted, not based upon such, adduces a more mighty argument for his position than volumes of hypotheses backed by the sign-manual of sacrosanct authority.

John Hunter said that the uterus might be fifty times as large in pregnancy as in non-pregnancy; that all the textures of the organ are increased in size except the nerves; and that therefore the nerves have nothing to do with the action of the enormously overgrown organ. Hunter was not much of a casuist or he might have been more careful on this occasion.

If, however, the uterus be fifty times as large when gravid as when not gravid, and the muscular fibres of the organ can be shown to be innervated like all other muscular tissue, somatic and splanchnic, what becomes of the innervation of the uterine muscle most distant from the point of entrance of the nerves at the cervix, if these nerves do not enlarge? Do they snap in the stretching? To ask the question is to insult nature. Is there, then, any provision for the adequate innervation of the gravid uterus without an anatomical increase in the size of the nerves in that state? There is; and a provision which to my mind is one of the most remarkable, as it is one of the most simple conceivable. It is a trite remark, that the great and the simple are often convertible terms, and nature is ever great, ever true; and could we but always hear its dominant note, even in apparently complex operations, I believe we should find it to be essentially as simple as it is great, strong, omnipotent.

The simple and sufficient expedient adopted by nature, under the conditions discussed, is one which was unknown to me when I undertook this investigation, and I am not aware that it has been described before.

Tortuosity in the blood vessels of the uterus, from their notable increase in size, is more apparent in the gravid than in the non-gravid organ. Tortuosity of the uterine nerves is, I believe, inversely as the size of the organ. Tortuosity of nerve-trunks may indeed be seen in the fully gravid uterus; but in none of the sections of the organ at term, which I have examined, have I observed by any means the same degree of tortuosity and coiling as in the nerves of the uterus in early pregnancy or post-partum. This coiling may indeed be such (as in one specimen which I show) as to suggest the figurative parallel of paying out a coil of rope to an object which is increasing its distance from a point of attachment.

In the facts I have mentioned, and the specimens I show, I believe I have grounds for maintaining that it is by this grandly simple expedient that the nerve supply of an organ, intended to vary in size, is adapted to these varying circumstances. The apparent increase in the size of the nerves, their more open texture, their more succulent appearance, are but adjuvant conditions which promote the paying out of the nerve-rope to the lengthening organ. When we come to examine the relation of the cardiac nerves to angina pectoris, in the next lecture, the bearing of these facts upon a wider range of physical conditions will be more apparent. The nerve-coil is, however, but an emphasising of that wavy elasticity, which the longitudinal section of any nerve with a considerable range of extensibility, such for example as the pneumogastric nerve, will show.

On the trunks of nerves in the substance of the uterus, I do not happen to have observed ganglion cells. I shall not, however, take upon myself to assert that they do not exist. Had they been common, I think I should have encountered them.

The conclusion, therefore, to be drawn from the facts I have stated, as regards the anatomical relations of the nervous system, in a physiologically hypertrophous organ, possessing a considerable range of normal variation in size, is, that there is no essential increase in the proportions of such nerves to such organ, but that anatomical and physiological changes occur in the nerves, which enable them to adapt themselves to the organ they supply, and in a measure control. The statement, that the nerves in a measure control the organ, requires some explanation, although to enter into a fuller discussion of the subject would be foreign to our present purpose.

As Galabin states in the passage I have quoted, "both reflex action and periodic centric discharge of nervous energy play important parts" in the process of labour. With essentially centric conditions I am not at present concerned. They stand in need of much elucidation still, and will doubtless in time, by a minute anatomical and physiological investigation of the sensory and motor cells which regulate uterine rhythmical action, be more or less satisfactorily explained. My present purpose is to suggest that one of the factors, in evoking reflex action at term, and in inducing those contractions, associated with pain, referred to the active viscus, under these circumstances, is the fact of the enlarged organ having reached at a certain period the full tether of its intrinsic nervous system. The rope has been paid out to its full convenient stretch, and the note is sounded for a return of the organ to more moderate dimensions. The admitted prematurity of labour, moreover, in many cases of twin pregnancy and hydramnion is, I would suggest, quite as valid an argument in favour of the theory I have suggested, as for the premature provocation of rhythmical uterine action without nervous influence. There is a crudeness about the suggestion, I admit, which at first repels one; but, having carefully thought the matter over, and without wishing to impute an unduly prominent *rôle* to this factor in the production of labour, I can come to no other conclusion. The predisposition to centric discharges, as Galabin calls it, is doubtless induced, *pari passu*, with the changes I have indicated, but I do not think that the factor named can be eliminated. As I shall argue again, a study of visceral pain in other organs appears to me to support my contention.

Robert Lee[1] maintained the same theses in connection with the nerves of the heart, when the organ is hypertrophied, which he did in the case of the gravid uterus. His words are: "The ganglia and nerves of the heart enlarge like those of the gravid uterus, when the walls of the ventricles are affected with hypertrophy." Cloetta, quoted by Walshe,[2] partly agreed with Lee, but could not decide whether the apparent increase in the size of the nerves was due to an increase in the connective tissue sheath or to actual increase in the nerve fibres. These assertions have not, so far as I know, stood the test of time, although I am unaware of any systematic examination of the question. In view of the facts I have stated in connection with the innervation of the gravid uterus, and which are opposed in great measure to Lee's conclusions, I should, *a priori*, dispute the correctness of his views as regards the innervation of the enlarged heart. There is, as I shall endeavour to point out in my next lecture, a special provision in the nervous anatomy of the heart, the same in principle as that met with in the uterus, and to which I have referred, for allowing the nerves of that organ, which varies so much in size during action, to adapt themselves to such variation. This provision, as we shall see, is less marked in organs such as the spleen and the kidney, with a smaller range of normal variation in size; and even in the heart, tortuosity is more apparent in the smaller than in the larger nerve-trunks.

Leaving nerve-trunks, I pass now to some mention of the pathology of the ganglion and the ganglion cell in the visceral nervous system.

Death, that universal law which organised matter must obey, and which has been suitably defined in scientific language on the tomb of Bacon, at St. Albans, as the command, "Let compounds be dissolved," induces changes in such compounds, whether they be individual cells, or those larger aggregates of cells, which were at one time a considerable part of Lord Chancellors of England and of more humble persons—changes observable, and yet not truly pathological, as we usually understand the term, but which may be mistaken for such. The criteria for their satisfactory discrimination from pathological changes, cannot yet be said to have been determined. To grow old is, in a manner, partially to die; to be enfeebled, is likewise a retrograde change. Advance in life, however, is not pathological—enfeeblement is; and yet changes may be met with post-mortem in the cells of old and young alike, which are at times difficult to distinguish the one from the other, which have both the common property of death, and death in the child is nearly always pathological. In some cases, in the aged, it can scarcely be regarded as such. This confusion between dead, young, and old tissue, is not, however, I think, frequently possible. Collateral conditions serve to distinguish the one infallibly from the other. The features of senile degeneration in ganglion cells, mentioned in one of the most recent and reliable works on diseases of the nervous system,[1] are a certain diminution in size and number of cells, and well-marked pigmentation, such pigmentation not being associated with notable disorder of function. This general statement must, however, be regarded comparatively, for the ganglion cells of a man who is "young," and whose blood is "warm within him," cannot but differ in appearance and functional activity from those of his "great-grandsire," virtually "cut in alabaster," though possibly still in the flesh, and whether the cells of the latter be pigmented or non-pigmented. When changes normal to senility are found in youthful cells, it is highly probable that the latter have been rendered functionally old by disease, and that the change must be regarded as pathological.

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[1] "History of the Discoveries of the Circulation of the Blood, and of the Ganglia and Nerves, and of the Action of the Heart," 1865, p. 28.

[2] "Diseases of the Heart," 4th edition, p. 281.

In writing of the changes met with in the cardiac ganglia, Ott[2] states that two kinds of pathological change occur in them, the one progressive and consisting of hyperplasia of connective tissue, and the other retrogressive and consisting of parenchymatous degeneration of new cells. The former he met with in congestion and hypertrophy of the heart; the latter he found associated with qualitative blood changes, such as uræmia and pyæmia. Ott does not remark upon the influence of these changes upon cardiac activity, but the association of parenchymatous changes in the cells in profound blood dyscrasiæ is a suggestive one, because it is just under these circumstances that degeneration of the visceral muscle is most frequently observed.

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[1] Leyden and Goldscheider, "Erkrangungen d. Rückenmarkes," Wein, 1897, S. 102.

[2] *Ztschr. f. Heilk.*, Bd. ix. No. 45, and quoted by Balint, *Deutsche med. Wchnschr.*, Leipzig, 1892, No. 1, S. 2.

The proliferation of connective tissue in a visceral systematic ganglion may, however, be of a more active type, as was shown by Lancereaux's case,[1] which so long reigned alone as an instance of cardiac neural pathology. In this case, the cardiac plexus participated in an extremely rich abnormal vascularisation at the root of the aorta, and showed microscopically a round-celled infiltration between the nerve fibres of the ganglion which compressed the former. These conditions were associated with *angina pectoris.*

But the progressive and retrogressive changes may be met with in the same case. A ganglionic structure may participate in a general interstitial proliferation, such as that met with in granular kidney. Although it may be difficult to decide whether the parenchymatous change in the nerve cell be due to such interstitial hyperplasia, or both it and the latter be the expression of a blood dyscrasia causal of each, the influence of interstitial cirrhosis, as interfering with the due nutrition of a nerve centre, cannot, I think, be altogether excluded, and may even be causal in some measure of the changes in question. Such changes need not, however, place the cell out of action, although it is highly probable that the functional activity of such a cell is subnormal.

This combination was well shown in a posterior root ganglion which I examined last year, and which I obtained from Dr. Risien Russell, Pathologist to the National Hospital for Paralysis and Epilepsy, in Queen Square. The case had been under the care of Dr. Hughlings Jackson, to whom I am indebted for permission to refer to it on this occasion.

A male, æt. 65, presented weakness and rigidity of the right arm; he could, however, move the arm and also the hand slightly. The left arm was normal. Both legs were weak and somewhat rigid, but the patient could get out of and into bed. There was some history of a fall a year previously. There was no facial weakness, except a slight difficulty in pursing the lips and whistling. The tongue was protruded rather to the right. There was no apparent difficulty in swallowing. The palate moved fairly. Articulation was much affected, and the voice was thick and harsh. The face was suggestive of a bulbar condition.

The knee-jerks were exaggerated; the right more than the left. Radial and ulnar reflexes were also exaggerated, and the plantar reflex was present. The sphincters were normal. The specific gravity of the urine was 1006, and it contained neither albumin nor sugar.

The autopsy took place *six* hours after death. The nervous system revealed nothing abnormal beyond an atrophic state of the convolutions of the hemispheres generally, and the cerebral vessels were atheromatous.

The kidneys presented the typical contracted granular appearance associated with the changes of interstitial nephritis, and the heart the corresponding condition of concentric hypertrophy.

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[1] *Gaz. méd. de Paris,* 1864, p. 432.

A posterior root ganglion, which I examined by various methods, showed well-marked interstitial hyperplasia, like that characteristic of the general state in which the body was, and parenchymatous change in a large number of the nerve cells. This change would, I presume, be termed pigmentary, but as the degenerated portion stained very darkly after exposure to bichromate of potash, osmic acid, and nitrate of silver, which had no effect upon the rest of the cell substance, a fatty degenerative change would appear to have been present. To compare with such atrophic and proliferant conditions, I may refer to the state of a posterior root ganglion from the body of a female, 18 years of age, who died in Queen's Square Hospital, of double pneumonia from mastoid disease, without central nervous complications. The case was under the care of Sir William Gowers, and the ganglion examined was given me by Dr. Risien Russell. The differences between the old degenerate ganglion associated with arterio-sclerosis and general interstitial hyperplasia, and the normal organ of a young person who practically died an accidental death, are very striking. The large, better differentiated cells, with little parenchymatous and no interstitial change in the young and normal ganglion, are easily distinguished from the ganglionic cirrhosis and degenerated cells of the decrepit old man. Nevertheless, as the history tells, the sensory conductivity of the cirrhotic ganglia does not seem to have been notably impaired. Leyden and Goldscheider,[1] however, basing their remarks upon the researches of Hale White, appear to consider that degeneration of the posterior root ganglion is a more important condition than a similar change in the semilunar and superior cervical ganglia of the sympathetic.

It is only necessary to refer to two other conditions of the posterior root ganglion, those, namely, associated with herpes zoster and dorsal tabes.

Atrophy and induration have been found in the posterior root ganglia, related to territories of skin affected by herpes, the agonising pain of many cases of which affection is so well recognised a clinical fact; while in dorsal tabes an inflammatory process, chiefly affecting the proximal and central portions of the posterior root ganglion and the posterior root itself, has of recent years attracted growing interest and attention. These changes are described by Leyden and Goldscheider as atrophic,[2] and affecting the nerve fibres. The connective tissue is also said to be increased, but the question of a change in the nerve cells is left undecided. The admitted alterations are, however, of interest in connection with the sensory disorders of the viscera, with which we shall be engaged in the next lecture, and particularly with the visceral crises of tabes, which have so pernicious an effect upon the course of the disease.

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[1] *Op. cit.*, S. 104.

[2] *Op. cit.*, S. 512.

Our knowledge of the course of visceral fibres in the central nervous system is still so limited, that a discussion of the pathological lesions associated with general trophic degradation would not at present be useful. It is a very remarkable fact, how little most central lesions outside the bulbar area are accompanied by such general atrophy. The two factors in chronic diseases of the central nervous system which appear to bring about malnutrition most rapidly, are pain and mental anxiety; and the latter may be regarded as pain in the intellectorium, just as the condition we conventionally call pain is a reaction in the sensorium, to use old terms, largely and perhaps prematurely discarded. Inasmuch as physical degradation will be brought about by these conditions, in the absence of central lesion, we cannot well gauge the influence of the latter, but it is rational to think that their presence hastens and emphasises the malign influence of pain and mental distress. The absence, indeed, of marked interstitial or trophic changes—that is, splanchno-motor changes—in disease of the central nervous system, and the evil influence of pain and mental distress, appear to me, on the lines of our anatomical discussion of last year, to be an argument in favour of the subordinate automatism of visceral motion. The avenues for viscero-sensation are, as we ascertained, more direct and open than the cumulative blockage of the efferent visceral nerves.

It will thus be observed how rudimentary our knowledge of the pathology of the visceral nervous system still is. There are, however, already hopeful evidences of light-giving work in this obscure field; and I cannot close this lecture without a passing reference to those histo-physiological investigations which have disclosed most interesting facts as regards the behaviour of nerve cells cut adrift from peripheral organs with which they are normally associated. The changes, although purely physiological, appear to point to a method of research which may lead to knowledge of pathological change in cells, whose touch of the organs they innervate may be loosened by disease general and local. Although I have myself undertaken some work on these lines, my work is still incomplete; and for the information on which my few present remarks are based, I am indebted in great measure to Van Gehuchten's exhaustive paper on the fine anatomy of the nerve cell,[1] in which also full references to the very interesting literature of the subject will be found.

It would seem to be essential to the maintenance of healthy structure in the nerve cell, not only that it should itself be undamaged, but that the organ its axis cylinder more or less innervates should also be in a condition healthily to exercise its function. This is surely a very suggestive fact as regards the relation of body and mind, the subjective recognition of which is at least as old as Juvenal, who associated the sound mind with the healthy body. The functional unit, in short, as we shall argue again, is not one but triune—peripheral organic cell—central nerve cell—blood. Our knowledge of the general effect upon the central nervous system of the severance of the periphery from the centre is as old as the researches of Bernard, Vulpian, and Dickenson (1829–1868), quoted by Leyden and Goldscheider,[1] who studied the effect upon the cord of the amputation of limbs; but our more exact knowledge of details in the process are much more recent, and due in great measure to the method of staining nerve cells introduced by Nissl, and which has already been fruitfully applied to the examination of normal and abnormal conditions of cells in the cerebral cortex.

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[1] *Cellule,* Lierre and Louvain, tome xiii. fasc. 2, p. 315 *et seq.*

Van Gehuchten's observations were made upon the hypoglossal and pneumogastric nerves of the rabbit, the latter nerve being divided below the plexiform ganglion.

The changes noted in the medullary nuclei of both nerves were—(1) A chromatolysis, during which the chromatic granules in cell protoplasm were dispersed towards the periphery of the cell, the protoplasm staining soon afterwards a uniform blue; (2) an eccentric displacement of the nucleus, which may proceed to its extrusion and the consequent sacrifice of the cell; (3) in the case of motor-cells, a gradual recovery, at least for the time, to their original chromatic or "pyknomorphic" condition was noted, while the sensory cells in great numbers disappeared absolutely. In illustration of these facts, Van Gehuchten gives carefully executed drawings. More recently, Goldscheider and Flatau[2] have studied changes induced in cells by various poisons of an organic and inorganic nature. Their results, with the use of tetanus toxin, are particularly interesting, as also are the effects they have observed to follow the exposure of animals to high temperatures. There appears to be a very noticeable enlargement of the cell nucleus in tetanus, and a complete chromatolysis seems to be induced by excessive temperatures.

Interesting, however, as these researches are, we are not yet in a position, as these authors confess, to draw very certain conclusions from them.

This sketch of the changes, pathological and experimental, met with in the visceral innervation, shows how little is, as yet, positively known of the alterations which underlie neuro-visceral disorders; but they likewise declare plainly that the night is past, and that daylight, more or less clear, cannot be very long delayed.

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[1] *Op. cit.*, S. 89.

[2] "Norm. u. pathologische Anatomie der Nervenzellen," Berlin, 1898.

(*To be continued.*)

THE INFLUENCE OF RAINFALL IN YELLOW FEVER.

By C. H. Eyles, L.R.C.P. & S.Ed., *Colonial Surgeon, British Honduras.*

At the threshold of any inquiry as to the influence of rainfall in yellow fever, one is met by a body of statements seemingly at variance with one another. Creighton lays stress on the fact that the first epidemic in Barbadoes followed a parching drought.[1] For Colin[2] says drought is "most favourable for the development of the miasms of yellow fever." Hirsch,[3] in his exhaustive summary, says epidemics have been observed to begin and to terminate with rain. To this Berenger-Feraud[4] adds, that at the endemic centres of the disease the annual explosion is deferred when the rains are delayed, and *vice versâ*. And finally, Davidson[5] dismisses rainfall as having no influence in yellow fever, except in so far as it affects temperature.

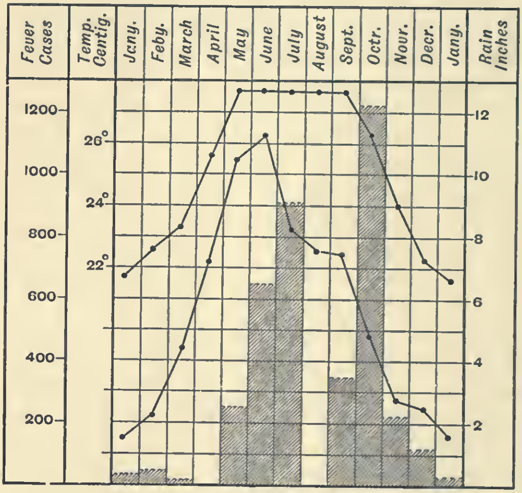

Fig. 1.—Temperature, rainfall, and yellow fever in Vera Cruz.

In view of all this, Fig. No. 1 is interesting. It is prepared from data as to Vera Cruz, furnished by Lombard;[6] and as he does not give the rainfall, I introduce it—as shaded columns—from another source.[7] The upper curve is that of temperature; the lower, that of incidence of yellow fever based on the admissions for a series of years into the Vera Cruz hospital.

For the beginning and end of the year there is some parallelism between the curves. But beyond this there is none. For at a time when the temperature is stationary, important fluctuations occur in the fever curve. When, however, we admit rainfall to consideration, this Figure in itself bears out many of the seemingly contradictory statements made by different observers. Before the explosion we have a season of drought—only 1 in. of rainfall in 120 days. The annual explosion occurs in May and June, *i.e.* with the initial rains. After this there are two months of heavy rain, namely, July and October, in each of which there is a marked drop in fever; whilst in the intervening period of little rain there is no oscillation in the fever curve. This suggests that rainfall must be admitted as a factor in the problem, and the most obvious effects of rainfall are on the soil.

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[1] "History of Epidemics in Britain," vol. i. p. 632.

[2] "Traité d. mal. epidém.," p. 280.

[3] "Handbook of Historical and Geographical Pathology," *Syd. Soc. Translation*, vol. i.

[4] "Traité théorique et clinique de la fièvre jaune," p. 426.

[5] Allbutt's "System of Medicine," Art. "Yellow Fever."

[6] "Traité de climat. méd.," tome i. tab. viii., and tome iii. p. 357.

[7] Davidson, "Geographical Pathology," p. 876.

It is interesting to note, therefore, that some connection has been observed to exist between yellow fever and certain conditions of the soil as to moisture. Observations as to the relative prevalence of malaria and yellow fever have been so frequent and so striking as to invite generalisation. Twice Lombard[1] repeats it, that there appears to be a *certain antagonism* between these diseases, of such sort that where the one prevails the other occurs but exceptionally. Remembering that up to recently malaria was identified with swamp land,[2] it is not difficult to form some idea as to what it was that so impressed observers. It appears to be that yellow fever rarely established itself in places which, owing to the swampy character of the soil, would be especially regarded as malarious.

The town of Belize is built on partially reclaimed swamp land on the Atlantic seaboard of Central America. It has rarely been visited by yellow fever, and even then the disease has not established itself in the town. Is this coincidence, or is there more than coincident in it? To study this problem I got together all available information as to yellow fever in Belize, and for about four years have taken a series of observations on the ground water level in the place. For ordinary record one reading was taken daily at 10 a.m. The fluctuations in the level attributable to other causes are so slight and occur so rarely that for all practical purposes they may be neglected; and it may be taken that the level of the ground water in Belize is determined solely by local rainfall.

The rainfall in December and January—about 5 in. in each month—is insufficient to sustain the ground water at the level previously attained. It therefore begins sinking. In the next three relatively rainless months it sinks more rapidly, till in May it is about 5 ft. below the surface. At about the middle or end of May the dry season is terminated by the initial summer rains; and if these be continued, the ground water rises progressively, till in October and November it is barely 1 ft. below the surface, and the soil becomes water-logged with even moderate showers of rain. It is needless to say that any given amount of rainfall will produce widely different effects according to the season. In the early months, with low water level and a parched soil, the effect of even heavy rainfall is but transient; whilst late in the year, with high water level and a damp soil, a relatively trifling shower of rain suffices to saturate the soil.

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[1] *Op. cit.*, vol. iii. p. 431, and vol. iv. p. 546.

[2] "Si, pour beaucoup d'auteurs, le marais est considéré encore comme la cause indispensable de la fièvre intermittente, c'est," etc. Colin, *op. cit.*, p. 130.

The town of Belize is about 120 years old. The original grants of land were made on condition that the lots should be properly filled up and reclaimed. But, owing to the dearth of suitable material, this condition has not been complied with. Ships' ballast is suitable material. But the anchorage is so far from shore that the cost of handling and lighterage makes the ordinary use of this material prohibitive. Beyond this ballast nothing is brought to Belize by way of import from places within the "yellow fever zone," and where the disease is active. This accounts for the rareness of *invasion* of the town by yellow fever.

But in 1849 and 1852, in two reports on quarantine against cholera and yellow fever, the General Board of Health in England put forth the *doctrine of an epidemic atmosphere.*[1] According to this, the "primary and essential condition" for the occurrence of these diseases was an "epidemic atmosphere," which might exist over thousands of square miles; and during its existence the disease might occur, irrespectively of traffic, in any unsanitary place within the area. This doctrine was implicitly accepted in Belize. Hence its local insanitation could give rise to but one opinion, namely, that if an "epidemic atmosphere" prevailed, Belize would suffer. The year 1853 was "one of the most terrible in the annals of yellow fever. The disease was widely disseminated throughout the Antilles. It occurred from the extreme north to the extreme south; the Greater and Lesser Antilles and the Bermudas were ravaged."[2] North America, South America, and the inter-American continent suffered. In view of the above doctrine, these events must have produced local dread. This soon found expression in the statute book. For early in 1854 an Act was passed to compel owners of property to fill up their lots.[3] The preamble reflected the theory; the penalty, the dread. This penalty was—*confiscation of property.* Six years later, when yellow fever did appear in Belize, a committee of the Board of Health, in reporting on the matter, referred to this Act as calculated to prevent such an occurrence, and complained that its provisions had been inadequately complied with. But had all the material available in the interval been utilised, the result would have been such that the same language might have been used.

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[1] Simon, "English Sanitary Institutions," p. 218.

[2] Berenger-Feraud, *op. cit.*, p. 123.

[3] Repealed as obsolete in 1879.

From Hirsch's tables we know that yellow fever prevailed in certain places at the end of 1859 and in 1860. From the local gazette I find that in the early months of 1860 vessels were arriving "in ballast" from such infected places, notably St. Thomas. In view of the current doctrine, of the above-mentioned drastic Act and the benefits it was supposed to secure, and of the arrival of ships from different places with their tale of yellow fever, it is but reasonable to infer that an "epidemic atmosphere" would be regarded as imminent, and a fresh impetus would be given to the reclamation of lots. In this case the ballast from these ships would be handy. Be this as it may, it is now we have the first definite record of yellow fever in Belize.

First Invasion, 1860.—The contemporary report accounts for the outbreak by the above doctrine. It dismisses transmission of the disease from place to place as but a popular error.

"Sporadic cases" occurred from February to May. In the first week of June the disease became "epidemic," and continued so till October. After this, occasional cases occurred till February 1861, if not till later.

Here the importation was in the dry season, during which sporadic cases occurred. With the initial rains the disease became epidemic, and continued so till October, when soil saturation is reached.

Second Invasion, 1869.—No report is available for this period, and the information is fragmentary. During the end of 1868 several vessels arrived in ballast from Colon with their crews fever-stricken. At first the disease was returned as febris remittens; but on the 17th May 1869, when it was reported, it was termed a virulent type of yellow fever.[1] By this date we know the disease was ashore; for the records of the local Jesuit mission show that a priest was attacked by the disease early in May 1869; and the local gazette announces a death from this affection in the middle of the same month. After this, scraps of contemporary record show the disease to have been about, but to what extent is unknown. One thing is certain at this time, Belize was distinctly infected; for vessels arriving here free from the disease contract it. Thus on the 23rd Oct. 1869, a date when there were at least two cases ashore, the *Lady Head* arrived in Belize harbour. Nothing of note occurred in connection with her till she had been a month in the place. Then five of her crew fell ill of yellow fever in three days. A fortnight later the disease reappeared on board, attacking the remaining fourteen persons in the course of seventeen days more.

The information for this period is too meagre to admit of any statement as to seasonal influence.

Third Invasion, 1886.—This was brought about by the use for road repairs of ballast taken from an infected ship. This material, "soft stone which crumbles easily," was broken for road metal, mixed with other stone, and "carted to different parts of the town streets." The distribution of cases was what might be expected. Road repairs amount merely to depositing small quantities of stone in the hollows formed by traffic. Thus a little stone goes a long way, and within a week or ten days of its being landed portions of stone will be found on the streets. The facts are :—

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[1] *Trans. Brit. W. Ind. Conf. on Quar.*, 1888, pp. 52–53.

19th June 1886.—The brig *Hedwig* arrived from Colon with a foul bill of health. On the voyage one of her crew died from "fever."

19th July 1886.—Released from quarantine. In the interval, two of her crew died from "yellow fever"; and all had had fever.

22nd July 1886.[1]—She had discharged her ballast.

5th August 1886.—The *Hedwig* left Belize.

9th and 10th August 1886.—The first two cases took ill, the one in the north, the other in the south of the town.

September and October 1886.—Fifteen other cases occurred. This outbreak of invasion was initiated during the rainy season. As in 1860, it terminated in October.

Recurrence of 1887.—From the middle of May to the middle of October, sixteen cases occurred. Again, as in 1860, the onset corresponds with initial rains; the termination with soil saturation.

Recrudescence, 1889-90.—The year 1888 was free. But at the end of 1889, in the coolest months of the year, yellow fever reappeared. And this is interesting in view of the rainfall for the preceding twelve months.

Month.	Rain.	Average.	Month.	Rain.	Average.
	Inches.	Inches.		Inches.	Inches.
1888. December	1·95	5·53	1889. June . .	5·45	7·70
1889. January .	1·54	5·32	,, July . .	14·45	7·33
,, February	2·52	3·09	,, August .	4·45	7·63
,, March .	2·94	2·41	,, September	2·44	8·58
,, April . .	0·70	2·51	,, October .	6·68	11·11
,, May . .	0·42	5·23	,, November	21·47	11·03

So far as soil conditions go, this was practically a prolonged dry season, effectually terminated in November and December. Then there occurred an unusally severe outburst of malaria, and with it yellow fever reappeared. There was no "epidemic"; but up to the end of 1890, cases continued to crop up at intervals of from two to five weeks, there rarely being more than one case under treatment at the same time. In 1891 there were three cases, after which the town has been free.

The health of the town previously to the recrudescence was spoken of as "phenomenally good." This, in Belize, means that malarial and rheumatic affections were conspicuously absent, and testifies to the dryness of the year.[1] Further, having before me the daily record of rainfall for this period, and guided by my observations on the water level, I constructed a hypothetical chart of the ground water level for the entire period. By the end of June this must have sunk as low as 9 ft. The July rain was so distributed that, under the circumstances, it could not have sustained the water level at a greater height than 4 ft., and after this the water would sink again. The soil condition, therefore, was one of prolonged dryness.

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[1] This date is from the books of the firm to which she was consigned; the rest are from published records.

Such, then, has been the history of yellow fever in Belize. It points to soil conditions rather than air temperature as influencing outbreaks of yellow fever. It shows that soil moisture following soil dryness is favourable to outbreaks of yellow fever; that soil saturation is unfavourable thereto. Another interesting point in this history is the want of persistence of the disease after importation. This can receive no explanation in the sanitary state of the town. From the collateral testimony of the Army Medical Reports, it is seen that in the years following the first two invasions there was no break in the local conditions that make for malaria. The disease did not persist. On the last occasion, shortly after the importation, there was a marked break in the conditions of soil usually existent; then followed a recrudescence, a revivification of virus as it were; and the marked manner in which the disease was localised around a place where, in 1887, a case occurred under conditions and surroundings that make soil pollution a certainty, was indeed very suggestive of soil influence. The want of persistence, and the recrudescence after suspension of normal soil conditions, lend countenance to the observations that were made as to the relative prevalence of malaria and yellow fever.

Whether the subject is dealt with from a clinical, a hygienic, or epidemiological point of view, one point is always insisted upon, namely, that yellow fever is a disease of summer-time. This was certainly so in New Orleans, where the annual range of temperature was such that, by examining the records of prevalence of yellow fever, some useful conclusions were arrived at as to ranges of temperature favourable and unfavourable to outbreaks. But when we turn to places where the favouring range of temperature is always existent, we still find a selection made: it is still a disease of summer-time. To accentuate this, it is usual to cite the data as to Vera Cruz in the north and Rio de Janeiro in the south, and to point out that, though the summer in these places is in different months of the year, yet the disease occurs in summer. This done, it is usual to state or imply that the governing influence is air temperature. I have already cited the data as to Vera Cruz. Borrowing from the same sources,[2] I now give the

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[1] Æstas sícca Romæ saluberrima.

[2] Lombard, *op. cit.*, tome i. tab. viii., and tome iii. p. 477; and Davidson, "Geographical Pathology," p. 941.

as to Rio de Janeiro in graph[illegible]
temperature. This figure [illegible] the
dotted curve is that of tempera[illegible]
[illegible] yellow fever during [illegible]
[illegible] the rainfall, it will be observ[illegible]
there is no corresp[illegible]
fever curve does rise [illegible]
its maximum after [illegible]
Cruz figure the fever [illegible]
at a maximum. In [illegible]
temperature is the p[illegible]

Yellow fever is [illegible]
Summer-time in the [illegible]
and rainfall[1]; and [illegible]

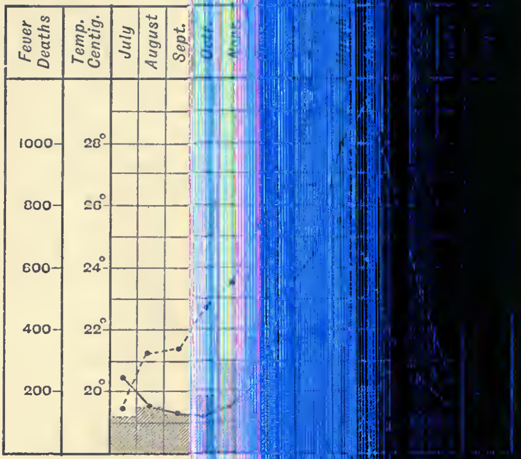

FIG. 2.—Temperature [illegible]
in Rio [illegible]

widely different effects according to the season, *i.e.* according to the amount of water already contained in the soil. Viewed, then, from the standpoint of the soil as affected by rainfall, summer-time in the Tropics is a season when the soil, previously parched and dry, is first moistened, and then gradually made more and more wet; and yellow fever is a disease of this season. And that this subject should be so regarded appears to be supported by the oft-repeated observation, that when the rains are delayed the annual explosion is deferred.

But the effects of rain differ not only according to season, but, in different localities, according to the structure and composition of the soil and subsoil. Hence, unless the rainfall is distributed in a markedly irregular manner, the mere record of total rainfall will not help the observer, unless he has intimate and minute acquaintance with the effects of rain on the soil of the locality concerned. This is shown in the two Figures presented in this paper. In the case of Rio de Janeiro, 27 in. of rain are distributed throughout the twelve months in such manner that, without actual observations on the ground water, it would be difficult to form any clear idea as to the results. But in the case of Vera Cruz, 39 in. of rain are so distributed that two months alone, July and October, receive more than half, namely, 21 in.; and during four consecutive months, January to April, there is only 1 in. Here we can form some conception as to the alterations produced; and when we appeal to the Figure, it bears out not only the limited experience of Belize, but also the seemingly contradictory conclusions of several observers.

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[1] "Dans la zone tropicale, c'est la saison chaude, qui est en même temps la saison pluvieuse."—Berenger-Feraud, *op. cit.*, p. 443.

"Les choses les plus contradictoires, en apparence, ont été dites au sujet de l'action de la pluie," says Berenger-Feraud.[1] But as these observations were made by competent persons, we must accept them as observed facts in nature—as truths. To do this is to admit a paradox. "But we must remember that so-called paradoxes are merely facts as yet unexplained." In this instance it appears to me that the solution will be found when we interpret the observations as to rainfall into terms representing the soil conditions produced by this rainfall. Apart from my own observations, the Vera Cruz Figure itself reflects the truth of many of these seemingly contradictory observations. It goes to show that we should not regard these observations as contradictory and mutually destructive, but as truths and facts capable of being welded together into one harmonious whole.

Tentatively, then, we may conclude that—(1) A dry state of the soil furnishes conditions that are favourable as antecedents to yellow fever; (2) that when this dryness is terminated by rain, the explosion occurs, and continues with a moderate amount of moisture; (3) that soil wetness, well pronounced, favours the decline of fever; (4) habitual wetness or moisture of the soil is unfavourable to yellow fever. All this means that yellow fever is a disease of the summer season in the Tropics, because this is a season when marked alterations in the soil are produced by rainfall; and hence when the rains are delayed, the explosion is deferred. As to temperature, so long as that is maintained above a certain point, that is all that is needed; and in the Tropics that minimum is more or less always existent.

In connection with this subject, it is impossible to avoid making some reference to two places noted for the prevalence of both malaria and yellow fever, namely, New Orleans and Rio de Janeiro. From the literature of twenty years ago it would be easy to cite opinions as to the endemicity of yellow fever in

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[1] *Op cit.*, p. 426.

New Orleans exactly opposed to one another. But the marked immunity of that town since its authorities have taken detailed precautions against importation, forces the conclusion that the prolonged history of yellow fever in New Orleans is resolvable into a history of repeated importations, and that the disease did not succeed in establishing itself there as an *endemic*. The same order of facts that used to be relied upon by those who denied that yellow fever was endemic in New Orleans, are now relied upon by those who deny its endemicity at Rio. But as the history of the place is now being played out, it would be premature to express an opinion on the subject, particularly as, from the point of view of this paper, important modifications appear to have occurred in the climate of Rio—modifications that cannot but result in producing marked alterations in the soil conditions of the place, as shown by the following passage from Lombard[1]:—"Depuis le siècle dernier où, d'apres le naturaliste Dorta cité par Sigaud, la quantité des pluies a notablement diminué, de 1782 à 1787 l'on avait compté 1454 mm, tandis que de 1851 à 1867 il n'en est plus tombé que 1096 mm. Les mois extrêmes sont, pour le maximum, décembre avec 148 mm, pour le minimum, juin avec 43 mm. En même temp que les pluies, le nombre des orages a diminué de fréquence et d'intensité, en conséquence du défrichement des forêts environnantes. Les mêmes causes sont invoquées pour expliquer l'abaissement des moyennes pluviométriques. Les orages étaient autrefois quotidiens: ils éclataient vers tres heures de l'apresmidi et s'accompagnaient de larges averses; les affaires cessaient vers cette heure de la journée et l'on se donnait rendez-vous *apres l'orage*."

THE CLINICAL ASPECTS OF ARTERIAL PRESSURE: SOME PHYSIOLOGICAL DATA BEARING ON THE CLINICAL OBSERVATION OF THE BLOOD PRESSURE

By George Oliver, M.D., F.R.C.P.Lond.

(*Concluded from page* 239.)

II. Physiological Causes of Variation in the Blood Pressure (Arterial and Venous).

7. *Respiration—The respiratory Pump Effort.*—The influence of ordinary inspiration and expiration on the blood pressure is so transitory and insignificant that in practice it may be disregarded. It is quite otherwise, however, when the respiration is stimulated to increased activity. During the past four years I have repeatedly observed that when in the vertical position of the body there is evidence of gravitation of blood into the splanchnic

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[1] *Op. cit.*, tome iii. pp. 451–452.

area, the downward drain may be arrested by respiratory exercises; the subject, the while in the recumbent posture, executing a series of full, deep, sustained abdominal inspirations, followed by slow respirations obstructed by a pursed mouth, and accompanied by firm contraction of the abdominal wall with pressure of the clasped hands.[1] Last year Leonard Hill and Harold Barnard demonstrated by a series of experiments that the respiratory mechanism "forms a second line of defence [the first being the vasomotor tone] against the influence of the force of gravity in conditions where the vasomotor mechanism is weakened or paralysed."[2] These clinical and experimental observations therefore coincide in supporting the same fact, namely, the counteracting influence of the respiratory pump over the effects of gravity when vasomotor tone is lowered or is lost. In the respiratory exercises just referred to, the muscles of the chest and abdomen are brought into active and prolonged contraction, by which the blood is pumped into the right heart from the venous system of the abdomen; and the splanchnic area is effectually compressed by the firmly contracted abdominal wall, which expels the excess of blood from it, and in the erect position of the body reduces the undue outflow from the capillaries into the splanchnic veins. In this way the respiratory pump is made available for restoring the normal postural variation of the arterial blood-pressure when it has become reversed by the loss of vasomotor tone. Frequent verification of this position has satisfied me that it is a fact. The same adjustment of the circulation takes place as the result of any effort which throws into action the thoracic and abdominal muscles. In all forms of effort the arterial and venous blood pressures are very markedly raised, just as they are in muscular exercise of all kinds. Efforts such as lifting weights, or pulling, etc., involve, however, something more than mere muscular action; they powerfully disturb the respiration. The glottis is partially or completely closed, and the intra-thoracic pressure is considerably raised. We have here, therefore, two important physiological causes of disturbance of the blood-pressure, namely, a respiratory as well as a muscular cause. In animals, experimentalists have conclusively shown that whenever the intra-pulmonary pressure is increased, the arterial blood pressure is lowered. But in man the raising of the intra-thoracic pressure by forced expiration, as in Valsalva's experiment, has seemed rather to afford evidence of a rise than of a fall in the mean arterial pressure. This contradiction has not yet been explained. Lately it has been suggested that venous congestion is sufficient to produce the evidence which has hitherto been regarded as pointing to a rise of the radial pressure.[1] It is quite obvious, and it is perfectly true, that the Valsalva experiment produces venous congestion. Until now the rise of venous blood pressure induced by this experiment could not be determined with any degree of accuracy. It is not so great as has usually been supposed. Observation has shown, for example, that forced expiration with closed glottis may raise venous pressures of 10, 15, or 20 mm. Hg, to 15, 20, or 30 mm.; or even to 20, 30, or 40 mm. The venous pressure can rarely be more than doubled. But the essential question is not—Does forcible obstructed expiration raise the venous pressure? but, Does it lower the arterial blood pressure in man just as raising the intra-thoracic pressure in animals lowers that pressure? According to my observation, using Hill and Barnard's sphygmometer and the hæmodynamometer, the Valsalva experiment does not diminish the arterial pressure. On the contrary, though the pulsations are reduced in amplitude, it raises the arterial pressure as well as the venous pressure. The following is an example—not so strong, however, as I could furnish:—

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[1] In the Croonian Lectures, 1896, I pointed out the corrective influence of respiratory exercises on vasomotor inadequacy. Lately Dr. Harry Campbell has published an elaborate and instructive treatise on the influence of "Respiratory Exercises in the Treatment of Disease," to which I must refer the reader.

[2] *Journ. Physiol.*, Cambridge and London, 1897, p. 324.

	Arterial Pressure.		Venous Pressure.
	Mean.	Maximum.	
Before Valsalva . .	105	155	10
During ,, . .	125	175	20

Therefore it would seem that a discrepancy actually does exist between the effects produced on the arterial blood pressure, by raising the intra-thoracic tension on the one hand in man by voluntary effort, and on the other in animals by way of experiment. How is this discrepancy to be accounted for? It has been shown that muscular action is a powerful agent in raising the blood pressure (arterial and venous). In man the intra-thoracic tension cannot be increased without bringing into play all the abdominal and thoracic muscles. It is highly probable that the energetic contraction of this extensive muscular area amply suffices to cause such a pronounced rise of arterial blood pressure as to more than counterbalance the lowering influence which experimentation in animals has shown to result from increasing the intra-thoracic tension; there remaining over a well-marked balance of rise in the arterial pressure. Therefore I infer that all the earlier observations in man pointing to this conclusion are well founded; and that in this case reliance should not be placed on what is merely suggested by experiments on animals which do not supply all the conditions of the Valsalva experiment in man. Observation shows that all muscular efforts with fixed thorax—whether the glottis be closed, or whether it be allowed to be open—have a pronounced influence in raising the blood pressure in the arteries as well as in the veins. They are powerful stimulants of the circulatory mechanism. There is, therefore, some valid physiological ground for believing that they should prove therapeutically valuable when duly adjusted and systematically applied in the treatment of disorders of the circulation; and experience has confirmed this forecast. They are particularly useful in the large class of cases in which the peripheral channels tend to shrink and contract from undue inaction, and the consequent absence of variation in the blood pressure. The frequent raising of the intra-thoracic pressure in such cases brings into play the tensile power of the blood pressure, so as to dilate the reduced vessels—the temporary cardiac and vascular tension being followed by an easing of the work of the heart, and a lowering of the arterial pressure.

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[1] See "The Effect of Venous Pressure on the Pulse," by Leonard Hill, H. Barnard, and J. H. Sequeira, *Journ. Physiol.*, Cambridge and London, vol. xxi. p. 147.

8. *Digestion.*—I will merely bring forward some preliminary inferences respecting the effects of the digestive process on the blood pressure; for my observations on this point are as yet not quite sufficiently numerous to warrant the statement of very assured conclusions, and moreover they have all been made on one subject only.

It would seem that the mere intake of solids or liquids produces at once a rise in the arterial pressure (mean and maximum) and in the venous pressure. It was observed that, in the morning before breakfast, the taking of a glass of cold water may, within five minutes, raise the arterial pressure 10 mm., and the venous pressure 5 mm. or more; and this effect may continue for ten or fifteen minutes. The mere ingestion of anything appears to stimulate the heart immediately in a reflex manner. This view is supported by the observation, that when the water is rendered more stimulant to the gastric mucous membrane by containing a charge of carbonic acid gas or of salt, the rise in the arterial and venous pressure is further increased. It is therefore quite conceivable that alcohol, ammonia, etc., have an immediate effect on the heart by reflex stimulation as well as by stimulation after absorption. The practical bearing of this position on the treatment of cardiac failure is obvious; for even the mere swallowing of cold water may rouse the heart, and the most effectual draught will be one that is most stimulant to the gastric surface. The marked increase of arterial pressure so frequently observed in cases of irritative dyspepsia may be largely explained on the ground of reflex stimulation—especially in the cases in which direct mechanical distension from flatus is not an obvious cause.

The digestive process affects the blood pressure considerably. The maximum arterial pressure is invariably raised throughout the digestion of each meal. As a rule, the mean arterial pressure is likewise increased, and the venous pressure falls; hence it may be inferred that contraction of the systemic arterioles takes place. This fact explains the sense of chilliness often experienced after a meal, which has suggested the old adage: "If you eat to be cold, you will live to be old." But it was observed that the rise of the mean arterial pressure and the fall of the venous pressure were not invariable. As a rule, they followed the ordinary solid meals; but after a meal, like that of breakfast, containing a preponderance of warm fluid, the mean arterial pressure much more commonly fell, and then the venous pressure rose. It may therefore be inferred that, as a rule, after breakfast the arterioles become relaxed, and that this difference in the peripheric effect of breakfast is due to the ingestion of warm fluid. The generally adopted custom of opening the day with a meal containing an abundance of warm fluid has a sound physiological basis; for the peripheral circulation in the early morning before food and exercise are taken is at its lowest point of activity, and the blood is then more concentrated than at any other time in the twenty-four hours.[1] The ingestion of warm fluids will favour the opening up of the peripheral channels, reduce the viscosity of the blood, and raise the venous pressure. In this way breakfast therefore tends to lower the mean arterial pressure—even though it raises the maximum arterial pressure.

After the first hour following a meal the arterioles dilate; then the venous pressure rises again, and often this rise greatly exceeds that which was recorded before the meal was taken.

9. *Beverages.*—Some observations—which, however, can only be regarded as preliminary—on the effects of the beverages (alcohol, coffee, tea) on the blood pressure point to the conclusion that they do not all exert the same influence on the different parts of the circulatory organs. It would seem that alcohol and coffee, for example, more particularly stimulate the ventricle, and that tea should be regarded mainly as a vasomotor tonic. Alcohol and coffee raise the maximum arterial pressure and the venous pressure; whereas tea augments the mean arterial pressure, lowers the venous pressure, and does not materially affect the maximum arterial pressure. It therefore follows that a combination of tea with a cardiac stimulant should prove more efficacious in raising the arterial blood pressure than one or the other alone. It is perhaps not improbable that this is the explanation of the remarkable restorative power of a small quantity of alcohol (such as a teaspoonful or so of brandy) when administered in a cup of

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[1] See The Croonian Lectures, *Lancet*, London, 1896, vol. i.

tea. This combination is not uncommonly resorted to for the purpose of quickly dispelling the effects of fatigue; and it is undoubtedly valuable as a quick cardio-vascular restorative. Its efficacy is, however, diminished when the dose of brandy exceeds the limited quantity just referred to—a teaspoonful or so; a quantity merely sufficient to stimulate the ventricle, but not such as to counteract the vasomotor tonic influence of the tea. The remarkable restorative action of tea probably largely depends on this vasotonic influence. We know that all forms of work reduce vasomotor tone; the worked parts, if exhausted, remain passively congested until restored by rest. This passive congestion is probably one of the main conditions of fatigue; there are, however, doubtless others, such as the products of chemical change and infiltration into the tissues, but the toneless state of the vessels plays a leading part in producing the sense of exhaustion. Tea quickly stimulates the peripheral vessels to contraction, and in this way restores the local circulation, raises the arterial blood pressure, and alleviates or removes the sense of fatigue. I have not yet ascertained whether this peripheral effect of tea is due to the theine or the tannin contained in it, or to both these constituents; but in any case, guided by what we know of the constrictive properties of tannin, it is not improbable that this substance, which is invariably present in the infusion, however prepared, exerts an astringing effect on the peripheral vessels. The unique vasotonic property of tea may account for the remarkably progressive ascendency of this beverage in public favour year by year by the side of the fluctuating demand for other beverages; and it may likewise provide the *raison d'être* of the now prevailing custom of tea-drinking in the afternoon—a period of the day, in fact, when physiological observation shows that there exists, as a rule, a marked lowering of vasomotor tone. Then again, the injurious effects of tea-drinking, as observed in [illegible] and neurotic, may to a large extent spring from this [illegible] influence of tea. It may foster the distal peripheral [illegible] of chronic goutiness, especially in women. Perhaps, [illegible] more highly tannin-charged varieties of tea—Ceylon and [illegible] so much favoured, are proving more injurious in this [illegible] than the China teas which formerly monopolised the [illegible]

[illegible] *Temperature, climate, baths.*—Variation of the surrounding [illegible] has no appreciable effect on the blood pressure (arterial [illegible] unless it involves the whole body or a large portion [illegible] immersing the arm in warm or cold water does not alter, [illegible] slightly, the local or the general blood pressure; but [illegible] exposure to warm or cold water, or to a heated or chill [illegible] at once disturbs that pressure. When the temperature [illegible] medium rises above a certain average range, the arterial [illegible] pressure falls and the venous pressure rises; and when it falls below that range, the arterial pressure rises and the venous pressure declines. But these general results are qualified by the rate and force of the heart's action; for when in a warm medium the heart contracts more frequently and with increased force, the lowering effect of heat on the arterial blood pressure is counteracted, and the net result may even be a rise in that pressure; and when in a cold medium the heart slows down, the rise in the arterial pressure is modified and may even be annulled. In this way the disturbing influence of the varying temperature of the atmosphere on the blood pressure is checked and controlled, and consequently the normal pressure, as a rule, remains but little affected by it. Though this is so in regard to the ordinary or minor changes in the temperature of the atmosphere, it has seemed to me, however, in the course of clinical observation, that the more pronounced variations do induce measurable alterations in the arterial and venous pressures; a spell of hot weather, such as we had during last summer, for example, seemingly lowering somewhat higher readings of the arterial pressure and raising comparatively lower readings of the venous pressure, and cold weather apparently increasing the former and reducing the latter—in a word, cold emphasising the indications of increased peripheral resistance just as warmth diminished them. Different individuals vary much in regard to their susceptibility to the effects of change of temperature on the blood pressure; the nervous and neurotic, and especially women, being particularly sensitive in this respect. Observation of the blood pressure (arterial and venous), by indicating the influence of the variations of temperature on the circulation in individual cases, may furnish useful hints in the selection of climate—temperature forming the most prominent feature in climate; the indications of an obstructed periphery, for example, pointing to the choice of an equable and warm climate, and the signs of a relaxed periphery suggesting a more variable, cool, and bracing climate.

Temperature is the main factor in producing the physiological and therapeutical effects of baths on the circulation; and these effects are brought about on precisely the same lines as those just indicated.[1]

11. *The effect of pulse rate on the blood pressure.*—An increased frequency of the heart's action, beyond that which is habitual to the individual, undoubtedly tends to raise the arterial and venous pressures. In a normal state of the periphery of the circulation —namely, that in which there is the normal capacity of onflow from the arteries to the veins—a more frequent heart rate *per se* should not necessarily raise the blood pressure; and the observed influence in this regard in health is only slight when the rate is but moderately increased, *e.g.*, 15 or 20 beats per minute. Then

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[1] The effects of baths on the blood pressure is too large a subject to be adequately treated of in this sketch. I hope to deal with it elsewhere.

the outflow from the arteries is about equal to the inflow, and the blood current is merely accelerated without rise of pressure. But the question is not a mere simple one of relation between the amount of ventricular inflow and that of arterial outflow through a normally free periphery; the force of ventricular contraction is likewise an important factor. As a rule, when the ventricle unloads itself, more frequently it contracts with greater energy, as when the heart's action is accelerated by exercise or by emotional excitement. And there is, moreover, a third condition, which is perhaps the most powerful of all, in determining a rise of the mean arterial pressure when the rate of the ventricular contractions is accelerated, namely, narrowing of the arterioles. When the terminal vessels become contracted—as under the influence of nervousness and fear—the mean arterial pressure rapidly mounts up; the rise being due to the conjoint operation of the rapid and more energetic action of the heart and of peripheral contraction. In the clinical field a more rapid pulse rate is certainly much more effective in raising the mean arterial pressure when the peripheral resistance is increased, either by vasoconstriction or by organic changes, than when it is normal, or when it is lowered as in the febrile state. It therefore follows that in clinical observation the frequency of the pulse should not be ignored when the arterial pressure is estimated; for it may be important to take into account its influence in certain cases. As a rule, for example, a slight or moderate rise of arterial pressure is of much greater significance when the pulse rate is infrequent than when it is normal; and a high arterial pressure becomes of less clinical import in proportion to the rapidity of the pulse.

12. *Diurnal variation of the blood pressure.*—Observation of the blood pressure (arterial and venous) throughout the day shows that the venous pressure is lower absolutely and relatively to the mean arterial pressure in the morning and in the earlier half of the day than in the subsequent hours and in the evening; and that the arterial pressure—and especially the maximum pressure—increases as the day advances, and attains its highest point in the evening. From this it may be inferred, that the vasomotor tone attains its maximum on awaking in the morning, and, gradually waning during the day, reaches its lowest degree at night; and that *pari passu* with this loss of tonicity in the vessels the energy of the ventricular contractions increases. Rest and sleep restore vasomotor tone, which is lowered by work; and the lessening of vascular tonicity is in some degree compensated for by increased activity of the cardiac muscle. As the day proceeds, the maintenance of the circulation depends more and more on the heart.

13. *The venous pressure — Causes of variation.*—The most characteristic features of the venous pressure are its great variability and the wide range of its variations. Whereas the mean

arterial pressure rarely exceeds the normal taken at rest by 40 per cent., and falls but slightly below it, the venous pressure may exceed an average mean by 150 per cent., and may fall below it at least 75 per cent. The large reserve capacity of the veins provides for this enormous range of variation, and is a necessity in order to meet all the physiological exigencies of the circulation.

The venous pressure rises from one or more of the following causes:—

(*a*) Relaxation of the terminal arteries and arterioles, as when the body is exposed to warmth; for example, the venous pressure may be more than doubled by a warm bath, while the mean arterial pressure may fall to a corresponding degree.

(*b*) Stimulation of the heart's action, as in emotional excitement. Observation has repeatedly shown that the venous as well as the arterial pressure may be raised in a marked degree when the ventricle contracts with increased energy from some passing emotion — this effect being produced quite independently of physical exertion. The distensile power of the intensified ventricular push suffices to open up the whole periphery and to raise the venous pressure at least 100 per cent.—even though the muscles are quiescent, and are therefore not contributing to the dilatation of the distal circulation. Repeated observation points undoubtedly to the conclusion, that of the two great causes of variation in the venous pressure, the centric and peripheral, the former is the more powerful, and is apparently capable of distending the peripheral vessels, and of immediately raising the venous pressure. Under ordinary physiological conditions, the venous pressure is closely associated with the arterial, and bears a certain relation to it. In the recumbent posture, with the arm extended on a level with the back, it varies as a rule from one-tenth to one-fifth of the normal mean arterial pressure. While the subject remains in the same position, it is found that when the arterial pressure is raised by whatever cause, as in the following observation on the effects of coffee, the venous pressure is likewise increased, and the venous rise is much the same as the arterial, and not a mere fraction of it:—

	Venous Pressure, Mm. Hg.	Arterial Pressure, Mm. Hg.		Pulse Rate.
		Mean.	Maximum.	
Before coffee . .	10	95	160	72
20 minutes after coffee	18	105	170	72
35 ,, ,,	20	105	170	72
40 ,, ,,	12	97	160	72

(*c*) Increased intra-thoracic pressure, as in all forms of effort, is another cause of the rise of venous pressure. It may double or more than double that pressure. Hence the heightened venous pressure observed clinically when the breathing is oppressed and the return of blood to the right heart is obstructed.

The venous pressure falls—(*a*) When the arterioles contract—as in exposure to cold and as the effect of fear; the low venous pressure observed in some nervous affections is due to arteriolar constriction: and (*b*) when the heart's action slackens—hence the lowest attainable venous pressure observed in recumbent rest.

14. *The normal readings of blood pressure* (*arterial and venous*).—Although the blood pressure is liable to considerable physiological variation, it is remarkably constant in the same individual in a state of repose; and the agreement between the blood pressures of different healthy subjects is sufficiently close for the setting up of a reliable normal standard. All physiological standards, however, require to be formulated with a certain margin of elasticity, so as to include individual variations consistent with perfect health; and the standard of blood pressure is no exception to this rule.

A large number of observations have led me to accept 100 mm. Hg. as the nearest approximation to the average arterial pressure taken from the radial artery in healthy subjects, placed in the recumbent position with the arm extended on the plane on which the back rests. To this average for the recumbent posture must be added a margin of about 10 mm. above and below it, to embrace the majority of healthy subjects and the average physiological variation. For the sitting position, with the wrist on a level with the epigastrium, 10 or 15 mm. should be added for the ordinary radial pressure in that posture. The arterial pressure is much the same in women as in men.

Observation points to an increase of arterial pressure after the age of 45 or 50. But this is a question somewhat difficult to decide with accuracy; for after 50 years of age there is, as a rule, less or more uncertainty as to whether the pathological may not be encroaching on the physiological. And, besides this, it is not at all an uncommon observation to find healthy subjects of 50, 60, or even 70 affording the low arterial pressure common at 20 or 30; a fact which often suggests a doubt on the physiological rise of the arterial pressure as age advances. Such cases, however, are probably exceptional instances of the postponement of the peripheral changes incidental to age; and this view is somewhat supported by the fact, that very frequently inquiry elicits a history of pronounced longevity in the ancestors of those presenting an exceptionally low reading of the arterial pressure after 50 or 60 years of age. Observation has shown that there are far greater differences in the normal arterial pressure in persons over 50 years of age than at earlier periods of life—differences which many, in fact, extend from the lower limit of 90 or 95 mm. to

10 mm. above the upper limit of 110 mm. in the recumbent posture.

Increase of weight above the average for height is generally associated with a rise in the arterial pressure; and in obesity the rise may become very considerable, and of pathological significance. As a rule, the normal arterial pressure is higher in big broad-built men and women, and lower in small and thin subjects.[1]

The average venous pressure for recumbency (the wrist level with the back) varies from 10 to 20 mm. Hg; and in the sitting posture (the wrist level with the epigastrium), from 20 to 40 mm. Hg.

From the foregoing survey of the physiological causes of variation of the blood pressure, it is obvious that all the conditions of life, except those of rest and sleep, raise the arterial pressure. They all imply physiological work of one kind or another; and physiological work has as its invariable concomitant a rise in the arterial blood pressure. Clinical observation of the blood pressure should aim, as far as possible, in excluding the influence of physiological variation by recording it in a state of rest. Exercise and emotional excitement are by far the most prominent causes of disturbance; all others being comparatively insignificant. It has been pointed out that physical exercise offers no practical difficulty; for its effects quickly subside. The disturbing influence of emotion is, however, sometimes not so easily dealt with, and in certain sensitive subjects it cannot be altogether excluded. In such exceptional cases no reliable readings of the blood pressure can be taken. In the vast majority of subjects, however, emotional disturbance is a purely transitory affair, and without significance as a source of error.

Finally, it is of great importance, in order to make the observation of blood pressure as reliable and as accurate as possible, to preserve strict uniformity in the gravity conditions—such as those which I have repeatedly referred to in this article.

ACUTE YELLOW ATROPHY OF THE LIVER.[2]

By David Robertson Dobie, M.D., *Coldstream.*

Though the lessons which we have been taught during our student career, and later as practitioners, are numerous and important, one cannot help feeling that in very many instances we are lamentably ignorant of the workings of which the human body is composed, and we only profess to try to put the functions of the body right, if they have gone wrong.

Diseases of a complex and varied nature are constantly cropping up before our vision, impressing this fact very forcibly upon our minds. I am of opinion that the case which has recently passed safely through my hands emphasises the truth of this statement.

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[1] The blood pressure is often low in the tall and slim.

[2] Read before the Medico-Chirurgical Society, Edinburgh, November 1898.

If ever in my life I felt in the position of a master of a ship with rudder and tackle gone, spars overboard, and nothing remaining but a frail wreck, with a valuable life to guide as best I could through a stormy sea, trusting more to the turn of the tide than to anything else, I did so through the early days of August last. I was face to face with a patient suffering from what I feel I am quite justified in diagnosing as acute yellow atrophy of the liver. This opinion will doubtless direct my reader's attention to text-books and authorities upon this most important and enticing subject, and in conjunction with the descriptions of the disease contained therein, I hope the case I am about to enter fully into and portray will be fully comprehended—symptoms carefully sifted and analysed in detail, and a correct estimate of the situation arrived at.

To the pathologist who makes the examination of the liver after death his special study, it seems impossible that any curative result can be brought about. He finds the liver cells in a state of demolition and disintegration, the red corpuscles of the blood diminished in amount and granular, the white corpuscles numerous; and all the excrement which the liver is supposed to destroy, in order to keep the blood in a condition of wholesome purity, is found in great abundance on crystallisation, namely, leucine and tyrosine, cholesterin and urea, in greater or less amount.

We are face to face with this complex and difficult question, Is the complex fluid called bile a secretion resulting from the metabolic activity of the protoplasm of the liver cells (Forster), or is it an excretion from the blood in the portal vein, through the agency of the liver by a process of filtration? It would be well to go back to our physiological text-books, and we cannot fail to recognise the fact that uncertainty does exist as to the origin of this most important fluid in the process of tissue formation and nutrition.

In all probability the pigments and biliary acids are formed in the liver, but the bile *per se* is only a more convenient arrangement of the animal economy, in facilitating the removal of the most poisonous and effete matters, which of necessity find their way into the blood.

The blood is continually changing as it proceeds on its course, leaving and taking up something at every new spot, and by those changes being always rendered more fit for the next duty it has to perform (Paget). We cannot fail to observe that the several substances which the blood contains separate themselves into groups for further use.

Each corpuscle is in fact a minute organism, within which chemical and [illegible] believed.

I can only [illegible] suppression of [illegible]

[illegible]

the [illegible] of jaundice. [illegible]

1. [illegible]

2. [illegible] the [illegible] pressure, with resulting inflammation of the mucous membrane and extension into the ductus hepaticus or the ductus communis. I have frequently observed patients who have had repeated attacks of biliary colic pass through the ordeal with little or no jaundice, owing doubtless to the fact that the duct had become permanently enlarged.

I am, however, convinced that we have jaundice arising from an entirely different cause, quite outside the liver and independent of any obvious change in the character or structure of that organ.

3. *Suppression of the secretion, not obstruction to the flow of bile; the deviation from the ordinary course taking place within the circulatory area, from some cause as yet unexplained.*—Cases of jaundice under this, our third subdivision, are numerous and

frequent. It would be positively absurd to eliminate the influence of mental emotion or severe nervous strain of an exciting or depressing nature, upon the secretion of bile.

When jaundice occurs suddenly under violent mental emotion, without any indication of calculi inflammation or organic disease, we are left to the conclusion that a reflex vasomotor influence from the central nervous system comes into play, and this fact has given rise to the popular belief, which exists in some countries, that excitation or depression of the cerebro-spinal mechanism is a predominating factor in almost every case.

Certainly under this third head we include—(1) Jaundice from mental emotion; (2) jaundice from snake venom, certain fevers, mineral and other poisons.

To enter into details regarding all those agencies bringing about an attack of jaundice would interfere with the purport of this paper—for my patient's history entirely excludes any possibility of his having been exposed to any external cause, such as I have tabulated; but there is one influence not before taken into account, and apt to be disregarded in this country, and that is the very high and long-continued high atmospheric temperature prevailing this summer over the greater portion of the British Islands.

The meteorological statistics at the beginning of the month show that the mean temperature was far above the average in all parts of the kingdom, 78° as the absolute maximum being registered—the temperature of the warmest day and the warmest night being the highest registered in August since 1893.

During the early days of the month, this district was under the influence of a large anticyclone with a steady high temperature.

Leaving the speculative opinion as to the *fons et origo mali*, I now take the opportunity of bringing the case before you.

J. F. S. æt. 50, married, farmer. Birthplace, Bergedorff, Prussia, living now in Berwickshire, and in this country thirty-three years. A singularly healthy active man of small stature, with three children—one dead of scarlet fever, to whom allusion must be made, namely, that this little patient had malignant scarlatina, and before death the whole surface of the body was covered with purpuric spots.

History.—On the 1st of August the patient was in the very best of health and spirits, and actively engaged on his farm and in his garden. He was much heated—partly owing to the rapidity with which he goes about his business, and partly owing to the almost tropical heat prevailing in this country at the time.

He rested well during the night, breakfasted heartily, and started on the following day with his wife on a journey of ten miles, to visit an aged relative. The sun during the day was very overpowering. On his return journey he felt decidedly ill; notwithstanding the external warmth he shivered from head to foot. The rigors were remarkable from their intensity. There was severe headache and general depression. However, Mr. S. was just the man to discountenance any medical interference at such an early period of the disease, but, thinking this onset betokened a type of influenza, an immediate adjournment to bed was the only thing decided upon. I happened to see Mrs. S. the following day on quite a different matter, but the somewhat sudden breakdown of her husband was recounted to me; and, acting on the information that he had been out of his usual the previous day, and had partaken of something which had not agreed with him, I ordered a seidlitz powder to be given immediately, and a dose of phenacetin should the intense headache continue.

4th August.—The patient has not yet been seen professionally, but I am told that he had spent a most miserable day—the great sickness and vomiting being uncontrollable.

5th August.—Early in the forenoon I was called for the first time, and I found all the symptoms of the day previous were exaggerated. The pulse was quick, the temperature 102°·8, and considerable tenderness existed over the whole abdomen, which I attributed to the excessive vomiting and retching. I made a careful examination of all the organs, and could not detect any abnormal condition in heart, liver, lungs, or spleen.

The urine was, however, highly concentrated, with about one-eighth albumin—no sugar. The specific gravity was 1022. I prescribed ice, Valentine's meat-juice, brandy, skimmed milk and weak tea. Medicinally I ordered mist. pepsin and bismuth, also a sharp purgative of calomel and colocynth, to be followed by a seidlitz powder.

6th August.—I found the patient not much changed for the better or worse; there was noticed a marked redness and flushing of the skin; also a most peculiar hue all over the face, the ears burning hot, the lips dry and parched. The temperature was 103°, and the urine was loaded with albumin and a very decided taint of bile-colouring noted. There was tenderness on percussion over the liver, but no enlargement or diminution in the size of that organ. There was great tenderness over the stomach, and an absolute inability to swallow or retain even a tablespoonful of milk. The only medicament that would be received by the stomach was brandy and ice.

7th August.—I saw my patient in the afternoon, and found a certain improvement in the condition of his organs generally. The redness of the skin had given place to an intense blackening of the deepest jaundiced type; the conjunctivæ resembled more those of a West African negro; the bowels acted naturally, but the exhaustion was extreme. I found the temperature 101°·4, and pulse 100, very weak and compressible.

8th August.—There was a decided fall in the pulse from 100 to 60, the temperature had gone down to 100°. There was complete drying up of all the salivary and mucous secretions about the mouth and pharynx. The jaundice was of a most remarkable type; it had more the appearance of a blackening, with a mummification or drying up of the whole surface of the body. The bowels were moved with hot Apenta water, and the sipping of this saline liquid was the only thing that relieved the intense thirst. It is worthy of note that there was perfect sensation, and the brain remained clear during the severe strain.

9th August.—The temperature had fallen to 99°·4, but the pulse still remained at 60 and was extremely thready and intermittent. The jaundice was intensified, the mouth and tongue having become quite black. Brain kept clear and calm, but the voice weak. The most alarming symptom, however, which manifested itself, was the severe hæmorrhage from the mouth and nose. There was constant spitting of dark, clotted blood. The treatment employed to combat this condition consisted of an astringent mouth wash and nasal douche. I changed the mixture to an acid, and gave a very grave prognosis.

10th August.—There were abundant hæmorrhagic petechiæ all over the forearms and upper part of the chest. The urine was found to be very black, like porter, and with great difficulty could it be passed on account of the long clots of blood. The urine on standing deposited blood in large amount. In the cylindrical vessel there was fully three-fourths of a deposit, which was microscopically examined.

Examination of the urine.—The transparent urine was of a very dark colour, having a specific gravity of 1024. Acid in reaction, distinctly albuminous, without a trace of sugar, it presented all the characteristics of urine loaded with bile. Urea was measured by means of the simple glass tube and pipette; the former being filled with the standardised solution of hypobromite of soda, and the measured quantity of urine introduced. My estimate of the amount of the urea came to very nearly 3 per cent. of the specimen examined. For clinical purposes the result was quite satisfactory, but for precise physiological inquiry it was doubtless inaccurate. The microscopic examination revealed a mass of a very heterogeneous nature. The crystals largely predominated, and no difficulty was experienced in at once differentiating the rare forms of leucine and tyrosine. The spheres of leucine, so familiar to all microscopists, and the sheaf-like collections of tyrosine needles were very beautiful. Abundant evidence of hæmorrhage from the mucous lining of the urinary tract was displayed. Cholesterin was not even wanting in the field of the microscope. I was struck with the beauty of crystallisation. What purity, combined with such a lethal poison, existed there. Surely those crystals had cast out all impurity; but they were themselves foreign to the elements they moved in, therefore their presence indicated a chemical disorder with a potency capable of paralysing animal life and energy.

11th August.—I found the patient very poorly, and in a weak, exexhausted condition. The amount of bile and blood in the urine had markedly increased. From the bowel there was passed abundant quantities of mucus mixed with blood. The body was covered with petechiæ, more particularly over the abdomen. From the mucous surfaces and from the lips and gums there exuded blood and mucus, truly a most pitiable object to behold. The examination of the liver disclosed the fact that the area of dulness had really disappeared. I visited the patient at night, hardly expecting him to live until next morning; but in order to insure a peaceful night I gave a large dose of bromidia, which, however, had little effect one way or other. I gave the opinion that it was only a matter of time, and my visit would be made next morning early, when I would endeavour to stop the hæmorrhage by the administration of a powerful astringent, which I would bring with me.

12th August.—I was early on the road to visit the patient, when I met one of the servants hurrying to tell me that Mr. S. was dying—"to come quickly." I was not surprised to hear it. As I expected, I found the patient very weak and exhausted. His appearance was remarkable. The condition already described was aggravated, and yet his brain remained quite clear, and on my urging him to make all things ready for his departure to the unknown, he willingly and bravely did so like a hero. Everything had been given him except the turpentine, which I had with me. I gave him about a teaspoonful of the oil of turpentine in a mucilaginous mixture. It was retained, as everything else was at this stage. The same quantity was retained in the afternoon, four hours after the first. On my visit in the afternoon I found a change had come over the patient. He felt better and had a cheerier look. He seemed to experience a new life, and had strong hope of yet being able to pull through. There was no sickness. His pulse felt fuller and stronger than it did in the morning. The petechiæ were very numerous all over the body, but the bleeding from the mucous membrane of the mouth and throat had ceased. I remained all night, giving at intervals of four hours about 15 minims of the mixture. In the early hours of the morning sleep returned, and on waking about 6 A.M. I gave a large dose of Apenta water. The bowels were slow to act, so I gave an enema and waited the result, which in the end was satisfactory, the motion smelling very strongly of turpentine. I had already asked my colleague to come and see the case with me, but he was unable to do so until the morning of the 13th. I pointed out all the important points and features in the case, and he can give an independent testimony of the condition, which he looked upon as very hopeless. The condition of the liver was fully recognised, but a change from the day previous had come about. There was dulness where before none could be detected. A finger's-breadth, however, would cover the area in the vertical direction. I was fortunate in obtaining the services of a professional nurse from Edinburgh, who took the greatest possible interest in the case, which to her and to me was unique. Her notes are herewith appended.

"14*th August.*—Restless night, but on the whole a number of favourable symptoms have presented themselves. Slept at intervals, and takes nourishment. Urine is passed more easily and is clearer, but intensely coloured with bile. The albumin is gone. The simple administration of 1 gr. of calomel at bed-time, followed by a dose of Apenta water, brought about a copious evacuation of the bowels.

"16*th and* 17*th August.*—Improvement continues uninterrupted, but the number of petechiæ over the abdomen and thorax has markedly increased."

On my visit on the 17th I noticed a marked increase of liver dulness; fully 2 in. could, without any difficulty, be easily made out.

"18*th August.*—The patient expresses himself as being fifty per cent. better. He has now a moist, cleaning tongue, and no bad taste in the mouth. The urine is cleaning rapidly. The ears are assuming a natural reddish hue; the colour between the fingers is coming round to the natural. The sleep which he now gets is refreshing and prolonged."

From this date onwards up to the present time there was a clearing away of all the symptoms. Nurse had left after a fortnight's untiring attention. The patient was now very yellow, combined with a certain amount of paleness. On 2nd September, when the last note was taken, we find the patient in his chair at the bedside, with a brisk appetite, regular motions, under a regimen of milk, fish, porridge, tea, coffee, mutton, or chicken-soup. Brandy had been administered in large doses

[illegible] than one teaspoonful at
[illegible] necessary. No further notes

[illegible] in the midst of apparent

[illegible]

[illegible] into the innermost structures of all the
[illegible] seeming security connected

[illegible] of onset, and the character of the
[illegible] case, its progress and its
[illegible] with the belief, doubtless a true
[illegible] atrophy. The cure of a
[illegible] must arise in the minds of
[illegible] It is only in the
[illegible] verified or negatived, and
[illegible] I would have carried out a careful
[illegible] the correctness, or other-
[illegible] concurred in the gravity
[illegible] as to its ultimate issue.
[illegible] interesting one, that my
[illegible] practical and theoretical

[illegible] the normal situation and size of
[illegible] in the right hypochondrium,
[illegible] diaphragm, and protected by the
[illegible] left lobe uncovered, which

[illegible]

cases it is much lower. When the extension or protrusion of the lower border is much beyond the boundary, the organ may fairly be assumed to be enlarged or dislocated. In this case we had marked increase in the volume of the liver on the day I first saw the patient, and I am sure, from the history of the great discomfort and rapidity of breathing during the onset, there had been tumefaction to a great extent. During the three subsequent days there was rapid diminution, until the Friday, when a fatal termination seemed inevitable—the liver dulness had disappeared entirely. The organ seemed to have receded to the vertebral column. When my colleague examined on Saturday morning, the dulness could be made out to be about a finger's-breadth, and I remarked to myself at the time that there was now a dull percussion note where before there had been absolute resonance. On subsequent examinations the organ was found to be gradually regaining size, and now the lower border can be quite distinctly felt in its normal position.

Urinary organs.—The quality of the urine was normal in amount during the first week, but when the hæmorrhage was severe it was diminished in volume and altered in consistence. I have already entered into a detailed description of the pathological appearances. As time passed on the deposits cleared away, and nothing now remains but a greenish coloration. There is no albumin in the urine at the present time.

Nervous system.—Beyond marked typhoid prostration on the ninth day from the onset of the illness, there was nothing to note. Herein does the parallel with other reported cases of acute yellow atrophy of the liver fall to the ground. The patient's mind remained clear throughout. He was all along able to recognise those around him, and he was perfectly calm even when life seemed to be ebbing away. The pupils remained in a normal condition; there never was xanthopia, or yellow vision; sensations were unimpaired, and there was no itching of the skin.

I must now, with considerable diffidence, shortly enter upon the most difficult part of the subject, namely, to account for all this disturbance of the physiological functions connected with the digestive mechanism. Can no definite theory be advanced to clear up the mystery? The liver, or factory organ, gets the blame. My opinion from clinical observation is, that this is a purely blood disorder, with such an intense vasomotor change within the liver that total collapse of the organ is the consequence.

Why do we meet with the symptoms I have described in so many conditions of blood poisoning? I have enumerated them. In such cases we have a distinct cause and effect; but here in this case we are bound to exclude all these causes, with the exception of the abnormal high temperature of the atmospheric air, with extreme dryness. That there was an influence of the nature of a miasm or contagium vivum contributing to the production of the disease, I am inclined to believe, but the exact bacteriological condition within the vascular area I am not prepared to state. There was some activity amongst the white leucocytes, and enormous destruction of red corpuscles, setting loose all the elements resulting from the digestion of nitrogenous tissue. The metabolic activity of the liver cells became disorganised and paralysed, finally disintegrated, and annihilated. This pathological condition is found invariably in those numerous fatal cases, and would have been found in my case also, had a fatal termination been the result, as was looked for and expected. The theoretical consideration of this obscure and rare complaint must be left in the hands of abler and more scientific observers than myself.

If I have succeeded in arousing in the minds of practitioners a fact that this disease is, as I believe, not a primary liver affection, and that it admits of a cure by a simple remedy,—for I have only to thank the one remedy employed, and which I do not notice ever to have been tried before,—then my labour in bringing this subject before the profession has not been in vain.

I cannot think that the *Lancet's* advice to students should be overlooked even by practitioners of many years' standing—

"All who follow the medical profession must be students for ever; from every case the real physician and the real surgeon has a lesson to be drawn. No man can dispense with observation or the results of observation. This need is never finite. For book learning there is a substitute, namely, experience; for experience there is no substitute."

Finally, in dealing with the treatment of this condition, I must subdivide the subject into three heads—(1) Treatment of the premonitory symptoms; (2) treatment of the hæmorrhagic state; (3) treatment of convalescence.

1. *The treatment of the premonitory symptoms* resolves itself into a very simple matter, and anything of a palliative nature to relieve the nausea, sickness, vomiting and thirst, must be appreciated by the intensely congested mucous lining of the digestive tract.

2. *The treatment of the hæmorrhagic state* is the most serious duty we have to perform. We know the dangers of delay in a stage like this, and we must guard against the loss of the living corpuscles amongst the dead. I have only to thank the administration of the oil of turpentine for saving the life of this patient.

Its actions and uses are manifold; as an antiseptic it is in daily use, and in small doses internally, such as 15 to 20 minims, it quickens the pulse, raises the animal heat, and even produces exhilaration. Now this is just what actually did take place. The patient felt the medicine "go through him."

When this action is steadily kept up, as it was in the case before us, the drug acts as a tonic of a very powerful kind, and is therefore useful in the typhoid condition of continued and other fevers.

Like many other volatile oils, it has a specific action on mucous membranes; its permeability through all excreting organs is undoubted, and although I cannot claim for it a specific property in jaundice, I am quite justified in placing the oil of turpentine amongst the most valuable therapeutic agents we possess.

I attach much importance to the careful attention of the "primæ viæ," by the regular administration of 1 gr. of calomel every night at bedtime, followed by a saline draught, in the shape of Apenta, next morning.

3. *The stage of convalescence is protracted and tedious.*—Careful dieting at the hands of a trained nurse is of the utmost importance. Fresh air and wholesome water are indispensable. Under such a course the improvement in colour of the skin and restoration of the wasted muscles had remained up to the present uninterrupted in my patient. Relaxation from anxiety and gentle country exercise will very speedily effect a complete cure.

The question now before us all is, What about the condition of the liver now?

A week ago I saw my patient at the sea-coast, and, after careful examination into every detail, I must conclude that the organ in structure and function seemed as good to-day as it was before he took ill two months ago.

AN UNRECORDED CASE OF THORACOPAGUS PARASITICUS, WITH SOME REMARKS ON DIPYGUS PARASITICUS.

By W. FINGLAND, L.R.C.P. & S.Ed., *Senior Anæsthetist, Liverpool Royal Infirmary, etc.*

(PLATE VI.)

As far as I have been able to ascertain, from reference to numerous works on monstrosities, the parasitic fœtus depicted in the portrait, which is copied from a rare mezzotint engraving, appears to have escaped description.

The Gentleman's Magazine, that great repository of general information, for 1777, contains a letter from a correspondent who quotes from Shaw's "Travels through Holland and France," published in 1709, and addressed to Lord Shaftesbury, stating that "Shaw had seen in Amsterdam an Italian youth that had a live child growing out of his side." The writer observes, "that as Shaw was a man of fashion and veracity, and wrote the account to the great Lord Shaftesbury, the truth of his assertion cannot be doubted, and expresses a wish that among the numerous readers of *The Gentleman's Magazine*, one may be found who will explain this extraordinary production."

In reply to this inquiry, another correspondent sends a small portrait of James Poro, which is reproduced in the magazine;—the editor, however, adds that "we have searched the Registers (probably the *Annual Register of Events*, a journal of that period) for the year 1714, but can find no mention of any such person." The portrait is described as of James Poro, son of Paul Poro, born at Genoa, 1686, and mentions that the child's name is Matthew Poro, and further states that this man was exhibited in London in 1714.

The great rarity of thoracopagus parasiticus is a sufficient reason for publishing this example.

The parasitic fœtus is attached to the autosite from the xiphoid to the umbilicus. It derives its nutrition from the autosite, and has no independent circulation. It is defective in development, and the upper and lower extremities are frequently absent or rudimentary.

Very few cases are to be found. Schenckius[1] mentions two examples quoted by Lycosthenes and Ambrosius Pareus.

But perhaps the most familiar and typical is that of Lazarum Colloredo, of whom Licetus gives an excellent portrait and description.[2] The left foot depended from the parasite, which also possessed two arms, both of which were terminated by three fingers. There was movement in the hands, ears, and lips, and a pulse in the thorax. The eyes were usually closed, and saliva flowed from the open mouth. Nothing was capable of being digested, nor were there any excretions excepting saliva and perspiration.

Halliday Croom describes a case[3] on behalf of Dr. Langley Mills; and under the title, "A Cuban Monstrosity," the *Lancet*, London, 1885, p. 1205, relates a similar example. Hirst and Piersol[4] describe a specimen in which the parasite is apparently as well developed as the autosite, but the authors remark "that, had the infant lived, the parasite would have fallen behind in growth." They are unable to give any history appertaining to it. Mention is also made of two examples described by Ahlfeld, in 1854 and 1879. Fœrster[5] has collected seven instances; and, lastly, Ballantyne[6] reports a case, abstracted from the Supplement to the "Reference Handbook of the Medical Sciences," of a parasitic fœtus attached to the sternum of the autosite (which was a negro infant), and consisted of an imperfectly developed head, defective limbs and trunk, with absence of genitalia.

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[1] "Monstrorum Historia," Frankfort, 1609, p. 25, Fig. 21.

[2] "De Monstris," Amsterdam, 1665, p. 274.

[3] *Edin. Med. Journ.*, vol. xxxiv. p. 116.

[4] "Human Monstrosities," 1892, fasc. 4, p. 195, plates xxxviii., xxxix.

[5] "Missbildungen des Menschen," Jena, 1861.

[6] "Teratologia," vol. i. p. 121.

The converse of this abnormality is termed dipygus parasiticus.

The parasite is acephalous, and consists of thorax, abdomen, lower extremities, and oftentimes of pelvis and lower extremities alone. Of this variety we have many well-authenticated examples. It is of more frequent occurrence than the symmetrical duplicity of the lower portion of the body (dipygus), from which anomaly, of course, it is quite distinct. The parasite may be attached to the thorax, abdomen, or pelvis of the autosite, and it has been pointed out by Hirst and Piersol in their work on "Human Monstrosities," already quoted, "that the higher the insertion the better the development of the parasite. Thus, if the attachment is in the thorax of the autosite, the parasite will usually have a thorax, abdomen, pelvis, and upper and lower extremities, some development of an intestinal tract, and frequently a duplicity of the external genitalia. If the attachment is to the pelvis of the autosite, the parasite will be represented by one or two lower extremities, and perhaps an additional penis and scrotum."

In all double parasitic forms, the parasite is deficient in development, even at a late period of its existence. The heart and other organs are rudimentary, and, as I have stated above, the fœtus is nourished by the autosite; although it is worthy of notice that some organs attain a remarkable degree of development, especially the kidneys and bladder, which perform their functions independently of the autosite. And it is also a singular fact that in all recorded examples the autosite and parasite are always of the same sex. Cases of dipygus parasiticus are not uncommon as compared with the rarity of thoracopagus parasiticus. Among the older writers, Schenckius[1] gives several examples, accompanied by two excellent illustrations. Ambroise Paré[2] illustrates a case, and gives the following quaint description:—"In the year 1530, there was a man to be seen at Paris, out of whose body another, perfect in all his members, except head, hangeth forth, as if he had been grafted there. The man was fifty years old, and carried the other, implanted or growing out of him, in his arms, with such great admiration to the beholders, that many ran very earnestly to see him."

Licetus[3] gives a drawing of this anomaly, and Rueff, in his most interesting treatise,[4] figures a case. Geoffrey Saint Hilaire[5] has collected four cases—three male, one female; and Fœrster[6] twenty-seven cases—twenty-three male, four female. Several instances are also cited by Ahlfeld.[7] It is, however, probable that a number of the above descriptions refer to the same cases.

A-ke, a Chinaman, exhibited in London in the early part of this century, was an example of dipygus parasiticus, and of whom a model is in the Museum of the College of Surgeons in London.

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[1] *Op. cit.* [2] "Opera, Parisiis," 1582, p. 735. [3] *Op. cit.*
[4] "De Conceptione et Generatione Hominis Tiguri," [Zurich,] 1654, p. 46.
[5] "Anomalies de l'organisation." [6] *Op. cit.*
[7] "Teratology," Leip-ic, 1880.

More recently, a case was reported by Bugnion,[1] quoted by Ballantyne,[2] and an admirably illustrated case, termed "Posterior Dichotomy," which I think might be included in the classification under review, appeared in the *British Medical Journal* of the present year.

In completion of this monograph, I will abridge from Hirst and Piersol,[3] descriptions of two recent typical examples, also from the *Transactions of the Pathological Society of London*,[4] an account of Laloo, who is now being exhibited throughout this country, which will amply set forth the characteristics of this class of parasitic monsters.

Case 1.—John Baptist dos Santos, born in 1845. From the pubes hangs a supernumerary lower extremity, united to the pubic bones by a movable joint. There is a double-jointed foot, having nine toes. The tibia is bifurcated below. There are two penes and two scrotums, each with a testicle in it. The thigh and leg are sensitive, but the foot is not. Urine is passed simultaneously through both penes.

Case 2.—Louise L., known as "La dame à quatre jambes," born 1869. Attached to the pubes is a rudimentary pelvis and two atrophied legs, the parasite weighing about 8 kilos. The attachment is by a pedicle, measuring about 33 cms. in diameter, having a bony basis, but fixed without a joint. The parasite has no external genitalia. The vulva in the autosite is displaced far backwards towards the anus, obliterating the perineum. At the insertion of the parasite are two rudimentary mammæ, one larger than the other. There is no active movement in the parasite. The joints of both limbs are ankylosed. No pulse can be felt, the temperature is much below normal, and on exposure the limbs become so rapidly cold as to cause the woman very great discomfort. Sensations can be localised in the parasite except in the feet. She was married in her fifteenth year, and was delivered, without difficulty, of two well-formed daughters, three years apart.

Case 3.—Laloo, born 1871, a native of Oovon in Oudh. Delivered in the cranial position, the arms of the parasite encircling his neck. There is no family history of malformation. He has enjoyed excellent health. When about two years old he had smallpox, the eruption appearing similarly on the parasite. The parasite consists of two main divisions. The superior consists of the upper extremities; the inferior, of the pelvis, the genital organs, and the lower limbs. Each of these divisions has a separate attachment. The upper part is attached by a bony process to the lower part of the thoracic wall, and movably articulated with a mass of bone representing the combined scapulæ. A fair amount of movement is allowable at the shoulder-joints, the upper arms can be withdrawn to an extent which permits the hands being placed on the man's shoulders. Both elbow-joints are ankylosed.

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[1] *Rev. méd. de la Suisse Rom.*, Genève, 1889.

[2] "Teratologia," vol. ii. p. 141.

[3] *Op. cit.*

[4] 1888, vol. xxxix. p. 427.

The hands are well-formed, but the thumb is absent from the right hand. The lower division, as before mentioned, has a separate attachment 2 in. below the upper. On compressing this pedicle, intestinal gurgling is very obvious; and, singularly enough, in 1888, Mr. Bland Sutton found that a long piece of intestine had descended into the parasite and was strangulated. This was reduced, and a truss designed to prevent its recurrence. No pulsation can be detected. The lower division consists of an ill-developed pelvis, sacrum, and lower extremities. The femurs appear to be approximated, and may be traceable to the pubic symphysis. The anus is, as usual in this variety, imperforate; the penis is well formed, but no testicles can be made out. The hip-joints are ankylosed, there is no movement in the knee-joints, and very little in the ankle-joints. The feet are well formed, excepting the left, which has but three perfect toes, the terminal phalanges of the first and second being absent. No spontaneous movement occurs in the parasite. Sensation can be localised in all parts, even when the man is blindfolded. Urine is passed independently by the parasite, and without the man's cognisance. After a heavy meal the man complains of a heavy weight in the parasite. The temperature was found to be below 95° F.

With regard to the production of the malformation under notice, Bland Sutton and Shattock, from whose extensive report the above is extracted, are inclined to think "that an originally single ovum gives origin during its development to two embryos—that is, that the germinal area undergoes cleavage, the yolk sac remaining common to the two parts, the rate of growth in the one part subsequently falling short of that in the other."

The results of operations performed for the separation of double monsters have been almost uniformly fatal, as the records of such operations show, perhaps owing to extensive intestinal union, and probably the absence of antiseptic precautions. But I am able to state a successful operation for separation in a case of dipygus parasiticus, occurring in the practice of Dr. Lardier of Rambervillers (Vosges), and carefully described with an engraving by Dr. Gross.[1] The child was born on 27th August 1876. The parasite was attached to the epigastrium between the umbilicus and xiphoid. It consisted of a rudimentary pelvis, a well-formed penis and scrotum, but the testicles were absent, both lower extremities ill developed, the left more so than the right; the feet and toes were well formed. The anus was imperforate. On 2nd October, five weeks after the birth of the child, Dr. Lardier divided the pedicle of attachment with complete success, the autosite remaining in perfect health subsequently to the operation.

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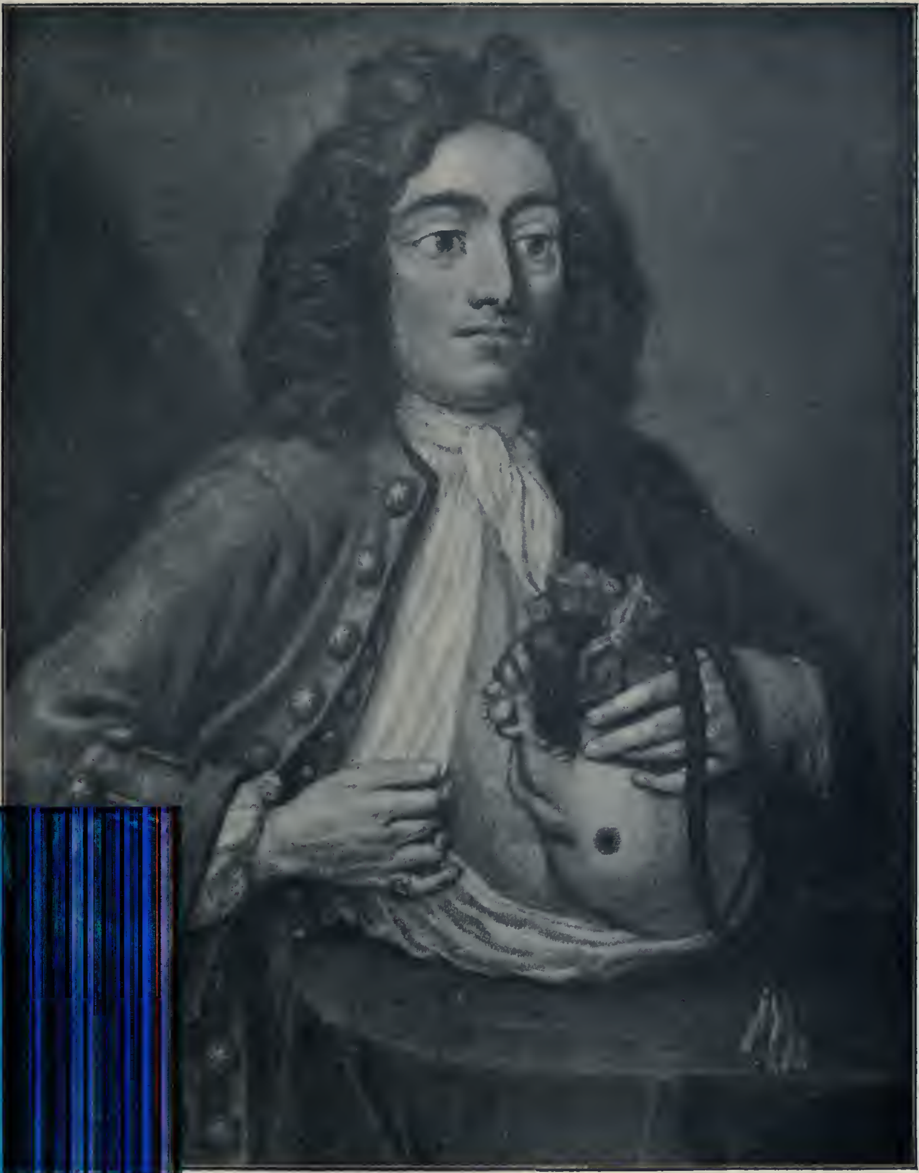
[1] *Soc. d. sc. Nancy*, 1876, p. 152.



CLINICAL RECORDS.

A CASE OF THROMBOSIS OF THE CAVERNOUS SINUS, WITH MENINGITIS AND PYÆMIA.

By Stuart M'Donald, M.B., C.M. (Ed.), *Pathologist to the Birmingham General Hospital.*

The patient, J. T., a lad of 16, was admitted to the Cumberland Infirmary, under the care of Dr. Maclaren, on 6th February 1898.

History.—On 16th Feb. he came home from work ill, complaining of a pain in his side, and feeling feverish. He was quite well the day before, and never had any previous illness of importance. He was seen the next day by a doctor in town, who found him suffering from symptoms of pneumonia, pleuritic pain over the lower and lateral part of the left lung, with dulness at the left base. His temperature was 104° F. The boy also complained of his left eye, which presented the appearance of a catarrhal conjunctivitis. There was no abrasion to be seen, and there was no history of recent injury. Exophthalmos of the left eye was noticed for the first time on 4th February, on which evening the patient was wildly delirious. He was seen the next day, in consultation, by Dr. Maclaren, who, suspecting either retro-orbital abscess or cavernous sinus thrombosis, passed a Graefe knife above and below the globe to the back of the orbit. No pus was obtained, however, and as the patient was getting rapidly worse, he was sent into hospital next day. Three weeks before admission, patient was knocked down by a box falling on the back of his head; he was not rendered unconscious, and was able to continue his work; he complained of pain in that region, however, for some days

State on Admission.—Patient was conscious, and complained of frontal headache; he was delirious at times, however, and could only speak a few sentences connectedly. He said he had no idea how his illness started, and was positive that he had received no injury to the eye. He was very restless, continually picking at his lips and nose; there was marked irritability of temper. The tongue was hard and dry, and covered with sordes; the bowels were constipated; the urine was passed involuntarily. There was copious perspiration, but no rigors. There was marked rigidity of the neck and retraction of the head, and patient seemed to suffer considerable pain on being moved. There were occasional involuntary twitchings of both hands and legs, and specially also of the face on the right side; at times there seemed transient paresis of the left side of the face. The temperature on admission was 103°·5 F. Respiration 30, and pulse 130, very small and weak.

Cardiac.—The heart sounds were also very feeble, the first being almost inaudible; there were no bruits or friction.

Pulmonary.—There was dulness at the base of the left lung, with some medium crepitations in expiration; a few râles and rhonchi were also to be heard on the other side, but the patient's condition made a detailed examination impossible.

Condition of the eyes.—There was well-marked exophthalmos of the left eye, with great tenderness of the globe on pressure; there was also tenderness on tapping over the frontal region; this was not specially marked on the left side; there was some tenderness also on pressing the right eye. The exophthalmos prevented one from seeing if ptosis was present. There was œdema of both upper and lower eyelids on the left side, and on that side of the nose. There was marked chemosis on the left side. The eye was covered with sero-pus, and the conjunctiva much injected, but the cornea was clear. There was no evidence of injury of any kind. The pupils were dilated and equal. They reacted sluggishly to light. There was no squint. The movements of the left eye were impaired all round, but there was no actual paralysis of any one muscle. Patient apparently could not see at all with his left eye, but with the right he could at least count fingers four feet away.

OPHTHALMOSCOPIC APPEARANCES. — There was well-marked acute optic papillitis on both sides, best marked in the left eye, where the veins were also markedly dilated; the discs were so congested, that it was at first rather difficult to differentiate them from the rest of the fundus; their edges were markedly blurred.

PROGRESS OF THE CASE.—Patient became more restless and irritable. The temperature in the afternoon fell to 101°·4, but rose again in the evening to 104°. The pulse became faster and weaker. He was seen again in the afternoon by Dr. Maclaren; the exophthalmos was even more marked than before. The incisions above and below the eye were again opened up, but still no pus was obtained. Patient became very delirious at night; the temperature rose at 1.15 A.M. to 105°; respirations 60, and pulse uncountable. He died at 3 A.M., seventeen hours after admission. The temperature immediately before death reached 106°·4.

POST MORTEM APPEARANCES.—Rigor mortis and post mortem lividity were marked. The exophthalmos was still apparent. There was no sign of any injury to the scalp, and on reflecting it there was no bruising on its under surface or effusion of any kind in the site of supposed injury. On opening the cranium the vessels of the membranes were found to be congested. There was no thrombosis of longitudinal or lateral sinuses. The vessels on the surface of the brain were markedly congested. There was early plastic meningitis all over, rather better marked at sides and vertex than at the base. At the vertex the sulci were filled with an œdematous gelatinous-looking material, with here and there a few minute greyish white points. The sides of the fissure of Sylvius were very adherent. There were no abscesses or hæmorrhages in any part of the brain. Projecting from the right ophthalmic vein was a small post mortem clot; on pulling gently on this, a long stringy ante mortem clot came away, tipped by a small post mortem clot at the other end. Nothing corresponding was discovered in the left ophthalmic vein. The left cavernous sinus was opened, and found to contain a drop or two of pus and pultaceous material. There was no ordinary thrombosis, and the bone around the sinus was not stained. The roof of the left orbit was chipped away and the optic nerve and retro-orbital fat exposed; a few more drops of pus were obtained here also. The sigmoid and other sinuses were healthy; the petrous temporal was healthy.

Heart.—No pericarditis; valves and orifices healthy.

Lungs.—Well-marked recent pleuritic adhesions over the lower and lateral aspect of the left lung, with some older, firmer adhesions over the corresponding region of the right lung. On section, both lungs were of a bright rosy pink colour, and, on squeezing, much blood-stained frothy mucus escaped, with some muco-purulent material from the smaller air passages. In the lower lobe on the right side were what appeared to be a very few very minute miliary abscesses. There was no actual pneumonic consolidation in any part of the lungs.

Kidneys.—Congestion but no abscesses.

Spleen.—Enlarged, weighing 10½ oz., very soft and friable.

Liver.—Congestion; on the upper surface, just below the capsule, were what appeared to be three minute miliary abscesses. There was no apparent disease in the ear, nose, or throat.

MICROSCOPIC APPEARANCES AND BACTERIOLOGY.—Films were prepared from the pus from the cavernous sinus and retro-orbital abscess; these showed numerous staphylococci, giving the appearance of a pure culture; no other organism could be detected. The muco-purulent exudate from the lungs showed numerous micrococci and bacilli of various sizes, apparently putrefactive forms.

EXAMINATION OF SECTIONS OF THE BRAIN, LIVER, AND LUNGS confirms the above observations. The tissues were fixed in corrosive and hardened in spirit in the ordinary way, and cut in paraffin.

Brain.—Shows congestion of the membranes. At one point, at some little distance in from the surface, are seen several minute miliary abscesses; and in sections stained by Gram, the cause of these is apparent in emboli of masses of staphylococci plugging the capillaries. At one point one of these abscesses is seen opening on the surface of the cortex, with consequent meningitis.

Liver.—Presents a similar appearance; acute congestion with fatty degeneration of the liver cells. A rather larger pyæmic abscess than those in the brain shows the cocci as before.

Lung.—In the sections cut, so far no organisms have been detected; but the acute pleurisy, with intense catarrh and hæmorrhage into the alveoli, are strongly suggestive of septic poisoning.

REMARKS.—The case seems to present a very clear picture of acute general pyæmic infection, from suppuration in the orbit. The external lesion is not apparent, but was probably some undetected abrasion, either about the eye or in some other part of the area drained by the ophthalmic vein. There is no evidence that the injury to the head was in any way connected with the disease. There are several unusual features in connection with the case. According to Macewen,[1] it is rare to meet with such an acute degree of optic papillitis as was present here; though the exophthalmos was so marked, the absence of symptoms due to implication of the third nerve is noteworthy, there being no squint, as has already been noted. The absence of a definite thrombus in the sinus may have been due to rapid disintegration of the clot; and the absence of staining in the bone around may be due to the same cause. As regards treatment of this apparently hopeless condition, the sole, if feeble chance, seems to lie in the early removal of the eye, with section of the optic nerve as far back as possible, and application to the stump of some powerful germicide, such as pure carbolic acid.

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[1] "Pyogenic Diseases of the Brain and Cord."

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

A Treatise on Aphasia and other Speech Defects. By H. Charlton Bastian, M.A., M.D.Lond., F.R.S. London: H. K. Lewis. 1898.

For upwards of a quarter of a century, Dr. Bastian has been a fertile contributor to neurological literature, and his works bear the stamp of the eminent psychologist, as well as that of the accomplished physician. Everything that he has written has been well worthy of a careful and attentive perusal, and his recent work on "Aphasia and other Speech Defects" forms no exception to the truth of the above statement; it is, however, a work to which it is impossible to do justice in a short notice, such as the exigencies of a journal permit of; in fact, it is a work quite *sui generis*, which does not easily lend itself to a review, but which must be read in its entirety to be appreciated as it deserves.

Perhaps no subject in the whole range of neuropathology has engrossed so large a share of the attention, not only of the medical profession, but of scientific men generally in all parts of the world, as the localisation of the faculty of speech, and the causes which interfere with the outward manifestation of this faculty; moreover, the greatest possible diversity of opinion has prevailed upon certain points at issue, and we quite agree with Dr. Bastian when he says: "The literature of the subject is enormous, and could not be dealt with in anything like a complete manner; still, I have striven to look at this complicated subject as a whole, and, while submitting many prevailing doctrines to a critical examination, I have interwoven therewith an exposition of the views which, after long study, I have myself been led to entertain."

With a view of weighing the value of the theoretical and speculative opinions prevalent, in reference to the subject he is treating, Dr. Bastian cites a number of typical cases, some of which have come under his own personal observation, whilst others have been culled from various sources, the authorship of which is in each case duly acknowledged.

After a few introductory remarks, in reference to the gradual development of speech during infantile life, the first chapter is devoted to the consideration of the processes on which the power of speaking, reading, and writing depends. In this section of the work, the author treats of localisation, and recognises four centres in the cerebral cortex which are concerned in the production of articulate language. Two of these centres he regards as excito-motor—the glosso-kinæsthetic which presides over articulate speech, and the cheiro-kinæsthetic which presides over written language; the third and fourth centres are the auditory and visual centres respectively. The second chapter, which treats of the "Relations g between Thought and Language," is one of extreme interest, and s an analysis of the views of Bain, James Mill, Max Müller, and

the third and eight following chapters, the different varieties of of speech are considered, and these form the most practical part treatise, a mere analysis of which the exigencies of space will not of; we will merely add that this section is illustrated by a number cal clinical cases, many of which were observed by the author.

an interesting chapter devoted to "Functional Disabilities in the o-kinæsthetic Centre," the author deals with a class of cases where ability is only temporary, and where the brief duration and the te recovery make it impossible that the defect can be due to any ral lesion. The principal causative conditions associated with this nal disability are considered under the heads of minute embolisms, of vessels, narcotic and other poisons introduced from without, s engendered within the system, epileptiform convulsions, fright, her powerful emotions; reflex irritation, hysteria, and thrombosis; the latter head the well-known and classical case of Professor is given, as cited by Trousseau.

considering disease in the auditory and visual word centres, the objects to the term sensory aphasia as applied to such cases, in distinction to those produced by damage to Broca's region, which monly spoken of as motor aphasia; and he adds that this mode of guishing these defects is not in accordance with his views, as he the latter (that is, Broca's region) to be as much a sensory region brain as the former. We gladly take this opportunity of correcting evailing idea that Wernicke was the first to call attention to the of sensory aphasia known as word-deafness and word-blindness. Bastian probably cares nothing about priority in this matter, but it ar that he recognised these sensory defects some years before the ation of Wernicke's work, a statement that can be verified by the "Various Forms of Loss of Speech in are recorded by various authors of the advantages of gesture, an art in which the professional mimes of Greece and Rome especially excelled. Our great national dramatist was fully sensible of the power of natural language, as shown by the following passage:—

> "There's language in her eye, her cheek, her lip,
> Nay, her foot speaks, her wanton spirits look out
> At every joint and motive of her body."

There cannot be a doubt that the study of the natural language of voice, physiognomy, and gesture has not received that attention which its importance deserves, and we regret that Dr. Bastian has not treated this part of his subject at greater length, as disturbances of the various forms of natural language add a gravity to a case of motor aphasia, and a study of these defects is an important aid to diagnosis and prognosis.

The capacity for the exercise of civil rights by aphasic patients is considered at some length, and is a question of great interest which is attracting considerable attention just now, as it formed the subject of a discussion at the late annual meeting of the British Medical Association at Edinburgh, arising out of a communication by Sir William Gairdner on the "Testamentary Capacity of Aphasics." Dr. Bastian has discussed this point very minutely, and, whilst admitting that there are many forms of speech defect in which it would be quite possible for a patient afflicted with aphasia to make a valid will, he summarises his views by saying: "There are three special classes of cases in which will-making would be attended with the greatest difficulty, or would be actually impossible—(1) Cases in which complete aphasia and agraphia exist; (2) cases in which complete word-deafness and word-blindness exist; (3) cases of total aphasia in which these two classes of defect are met with in the same individual."

It must be recognised that aphasia does not necessarily entail testamentary incompetency or inability to discharge civil or social functions; in fact, wills or other legal documents should, as a rule, be recognised as valid when the parties concerned understand fully what is put before them, and can express assent or dissent with certainty, whether by articulate, written, or gesture language; for, as Maudsley has observed, "language consists essentially in the establishment of a definite relation between the idea and the sign by which it is outwardly expressed; it may be verbal, vocal, graphic, or mimic." Our English courts of law evidently take this view, as shown by the fact that a will disposing of a sum of thirty thousand pounds, made by a Norfolk clergyman affected with right hemiplegia and aphasia, and who could neither speak nor write, was held by the President of the Court of Probate to be a valid testamentary document; and he said the will would have been allowed to stand, had it not been for a technical error, namely, that the testator's mark was not inserted in the right place. The judge evidently took the view that the testator's signs evidently expressed his testamentary wishes, his gestures answered to rational conceptions, and were external though not oral manifestations of the *verbum mentale.*

In a chapter devoted to diagnosis, the author gives an elaborate scheme for the systematic examination of patients affected with aphasia, based upon the physiological views expressed in this work, adding that, "if we are to form a correct clinical and regional diagnosis, it is highly desirable to submit all such cases to a complete examination, in accordance with some uniform and definite scheme."

Attention is also called to the benefit that may accrue by judicious surgical interference in cases of traumatic aphasia, and a case is quoted in which a traumatic aphasia was cured by operative measures that were had recourse to several weeks after the original injury.

Dr. Bastian concludes his elaborate and interesting treatise with a chapter on the "Treatment of Speech Defects," in which he says: "We have to look to two distinct sets of indications—first, as to the best means for bringing about functional restitution; and, secondly, when all that is possible has been done in that direction, to do all in our power that may be calculated to further functional compensation."

The work is profusely illustrated with several well-executed lithographic plates, and contains an immense amount of original matter. It is a valuable contribution to the literature of aphasia, and cannot fail to enhance the already high reputation of its author.

FREDERIC BATEMAN.

The Diseases of the Lungs. By JAMES KINGSTON FOWLER, M.A., M.D., F.R.C.P., and RICKMAN JOHN GODLEE, M.S., F.R.C.S. London: Longmans, Green, & Co. 1898.

THIS is an excellent work, and contains in manageable compass a large amount of information on lung diseases, and the most recent ideas as to their treatment.

In the old Edinburgh Infirmary a medical practitioner appeared on one occasion with a patient he had had under his care for some time, and about whose condition he was not quite sure. He thought he had some kind of fever, but he had broken or lost his thermometer. The patient was forthwith tapped, and several pints of serum taken from his right pleural cavity. "I might have found that out myself," said his medical adviser afterwards, "if I had made the man take off his shirt."

On another occasion a patient was sent with a letter in which his doctor described his ailment as "a pulsating tumour in the back, which," he added, "the professor will be better able to give a name to than I am."

Trouble in collecting facts, and some trouble in reasoning upon them, are unavoidable in lung diseases, if accurate diagnosis is desired; but, taking this for granted, this book ought to be a great help at arriving at such a result.

A preliminary and well-illustrated chapter on anatomy is given, in which the author adopts Aeby's view of the branching of the bronchii, as against the old view of dichotomous subdivision. In that upon "Physical Diagnosis" the attention given to cardio-pulmonary sounds is worthy of notice. Various conditions are described which may lead to the development of false or exocardial murmurs; and the means by which these may be distinguished from valvular murmurs are pointed out. Elsewhere the qualification of Louis's law as to mitral murmurs in pulmonary tuberculosis is mentioned; chronic valvular lesions occurring in 3·7 per cent. of the Brompton Hospital cases, the mitral valve being most frequently affected (p. 363).

Bronchitis is discussed thoroughly, and the details of treatment are fully dealt with. Under the Climatic Treatment of Chronic Bronchitis (p. 112), reference is made to "the towns along the Undercliff of the Isle of Wight." Ventnor is the only town in that locality.

Excellent chapters are given upon bronchiectasis, asthma, and upon emphysema. Details of cases of bronchiectasis, treated by Arnold Chaplin's method of inhalation of coal-tar creasote, will be read with interest.

Coming to pulmonary tuberculosis, reasons are given for adopting that name, to the exclusion of "phthisis" and "consumption," with which most physicians will agree. But even this name is not ideal, and the language of "tuberculosis," before it meant, as now—bacillus plus tissue reaction—is not infrequently inapplicable to existing pathological notions. The author repeatedly uses the word "infiltration" to indicate the products of bacillary activity and the bacillus, *i.e.* the tubercular lesion, which hardly agrees with the "morbid anatomy of tubercle" given (p. 299). It is, however, so general to use the word tuberculosis, as indicating the presence and activity of the bacillus, that it is obviously convenient to use it to indicate the same condition in the lungs.

Both from a clinical and from a hygienic standpoint, it is satisfactory to have on such authority the statement that "in considering the etiology of tuberculosis, *infection* must be regarded as the *causa sine quâ non.*" For, however interesting from a biological point of view the doctrine may be that the virus of the disease may be transmitted through several generations, its influence upon remedial and upon preventive medicine must be most discouraging. Few things in medicine have been more remarkable in recent years than the impetus which the discovery of the *Bacillus tuberculosis*, and the belief in its transmission by infection, have given to the search for means to extirpate the disease when established, and to prevent, if possible, its transmission from the infected to the healthy.

The classification of the varieties of pulmonary tuberculosis here adopted is simplicity itself, in comparison with some previous attempts in this direction. But it is a pathological and not a clinical classification; and although the author is of the opinion that "the miliary, caseous, and fibroid varieties of the disease are characterised in each case by a definite and distinct range of temperature" (p. 323), it can only be regarded as a provisional, and not as a permanent, classification for clinical purposes, seeing that cases present every variety of distribution and of progress of the disease.

The treatment of chronic tuberculosis is probably the section of the book which will be turned to most frequently, considering the experience of the author, and the great interest that has surrounded this question in recent years. With the opinions expressed upon the use of tuberculin, as originally employed in this disease, most of those who have used it will agree. It is a reagent of unique potency, and the effects of the violent reactions at first induced, and the dangers of fresh explosions of disease from the rapid local changes, were undoubtedly in some cases most serious. A danger not referred to here, but one of a serious character also, was the liability to grave hæmorrhage, if the disease was at all extensive. Yet, when the utmost is said in this direction, there remains the fact that tuberculin, used judiciously in selected cases, has been often most successful; and one cannot but hope that either by modifications in the reagent itself, or by a better knowledge of how and when to use it, we may be able to rely upon it ultimately as one of the most serviceable means in the treatment of this disease.

The "open-air treatment" is also referred to, and details of the method followed at Nordrach are given, but its employment in England is hardly developed enough for much to be said of it in such a work as this.

Necessarily, in this short notice, much must be left unsaid that might be said of a book so full of interest. The modest aim of the authors, "to produce a work likely to prove useful to those engaged in the practice of medicine," has been most abundantly and successfully achieved, and it is not unlikely to prove one of the most popular works of the kind of recent years. ROBERT ROBERTSON.

A Manual of Bacteriology. By RICHARD T. HEWLETT, M.D., M.R.C.P., D.P.H. London: J. & A. Churchill. 1898.

THE object of the author is to give some account of those portions of bacteriology which are of especial interest in clinical medicine and hygiene. The first thirty pages are devoted to the classification and the biology of the bacteria. Next the laboratory methods are dealt with at some length; here we cannot agree with the recommendation to plug tubes, etc., *after* sterilisation (p. 39), nor with the statement that large glass vessels cannot be sterilised with safety in the hot-air steriliser, for, as a matter of fact, any glass vessel, however unequal in thickness in its parts, can be sterilised with impunity by this means; again, cotton-wool is stated to become brown and brittle at temperatures above 130°. Under Uschinsky's fluid (p. 48) we read that "Pathogenic organisms grow well in it, and produce their toxins"; this is too general and inclusive to be true. Amongst the staining methods we do not find the useful "universal" method of R. Pfeiffer. Eosin is said to be a "somewhat diffuse" stain (p. 76); there is no mention of the work of Ehrlich on the differential action of acid and basic stains. The fourteen pages devoted to Immunity, Antitoxins, and Antitoxic Treatment can hardly be said to have solved the difficult problem of writing a succinct account of the present state of knowledge upon these subjects; some of the quotations selected are not altogether happily chosen—thus the old observations of Lewis, Traube, and others, on the disappearance of organisms after injection into the blood stream, are apparently given as evidence of the germicidal power of the blood; also the type of serum which is obtained from animals which have been immunised against cholera, etc., is not referred to, though later (p. 252) Pfeiffer's test reaction is partially described, without any mention of a control experiment. The bulk of the book consists of descriptions of the well-recognised bacteria which are pathogenic to man, certain allied forms being also dealt with. At the end of each description a few notes are given for guidance in clinical examination; these, though not pretending to be exhaustive, are sufficiently precise in most instances to be of practical value. Under the heading Suppuration and Septic Conditions, a curious heterogeneous collection of micro-organisms is dealt with, including *Diplococcus "intERcellularis" meningitidis*, *Micrococcus "tetragOnus,"* and *Bacillus coli communis*—the last being called "one of the most important organisms of suppurative peritonitis and puerperal fever," to which some might take exception, as well as to the statement (p. 241) that this bacillus has shorter flagella than the typhoid bacillus. In treating of diphtheria, the author's well-known leanings towards the identity of the "true" and the "pseudo" bacilli are introduced; hence we are not surprised to find that (p. 269), "if the pseudo-bacillus be found, it is probably wise to regard the case as diphtheritic." Under Tuberculosis the existence of the actinomycotic form is not hinted at. In dealing with the influenza bacillus the use of media containing blood is not mentioned; the German authorities agree in regarding the failure to grow on ordinary media to be of critical importance. Malaria and some other diseases related to protozoal infection are shortly described. A few pages are devoted to affections which are of uncertain etiology, such as rabies and scarlatina. A chapter deals with diseases not referred to earlier in the work; here we may note that the application of the agglutination test for the diagnosis of Malta fever is omitted. The methods of examination of water, air, milk, etc., and a chapter on Antiseptics and Disinfectants complete the book, to which is added an appendix containing notes upon Antitoxic Treatment, Tuberculin, etc.

All through the book the style is more loose than could be wished. Small mistakes and typographical errors abound; on p. 38 we find the sentence, "two or three platinum needles (öse) are required," the "öse" possibly refers to the German word *Oese*, which technically means a platinum loop. On p. 160 we are told that rabbits can be immunised against anthrax to such a degree that they can be given 200 to 300 c.c. of virulent culture. Herpetomonas, Bignami, each appear on more than one occasion as "herpomonas," "Brignami." Massowah is given as "in India." Ernst is the observer who described the α and β varieties of the *Bacillus pyocyaneus*, and not Gessard as given; the tubercle bacillus stain given under Delépine's name is essentially due to Kühne. Hardly a score of pages can be turned over without detecting similar errors. The reproduction of many of the illustrations is far from good, the worst perhaps are those representing the culture and flagella of the typhoid bacillus; the student would perhaps hardly think that there could be much difficulty in discriminating between the tubercle and the smegma bacilli by reference to Figs. 37 and 42. Although there is much that is good in the book, we fear that in its present form it will not be widely recommended by teachers to their pupils. Herbert E. Durham.

Nasal Obstruction: The Diagnosis of the Various Conditions causing it, and their Treatment. By W. J. Walsham, M.B. Aberd., F.R.C.S. London: Baillière, Tindall, & Cox. 1898.

A somewhat novel way of dealing with the subject of nasal obstruction in book form is here placed before the reader. As the author remarks in his preface, he works "from the known to the unknown," and instead of first describing a disease, and then discussing how it may be diagnosed from similar affections, he works from such conditions as redness, hardness, and swelling to the unknown disease of which they are the signs. He tabulates the various conditions which may give rise to nasal obstruction, and the table is a large one, and he then proceeds to deal in detail with these conditions, working at them from the point of view of diagnosis.

As we read we are forcibly reminded of certain manuals of anatomical dissection, where the student is asked to do this or that, or to turn to such and such a paragraph or page, in order that he may continue the subject with which he is engaged. We will merely cite the two following instances, out of many which occur, in order to make our meaning clearer:—"If nothing abnormal is discovered by anterior rhinoscopy, begin below at section 1; if something abnormal is found, pass on to section 4." And again, "Proceed, after reading sections 2 and 3, to the examination of the posterior nares and naso-pharynx, as set forth in section 170, chapter ix." We think that the method adopted by the author is an excellent one, when employed in the clinical demonstration of cases; when presented in book form, however, though the essential points are brought before the reader's notice, there is too much reference to different sections and chapters to admit of any consecutive reading. With the great subdivision into headings, we are afraid that the general arrangement adopted may have a tendency to lead to some confusion in the mind of the reader, and to make the subject of nasal obstruction appear of greater importance than it would merit.

Passing from this somewhat adverse criticism of the method adopted in placing the matter before the student, we turn to the description which is given of the various lesions that may be met with in the nose and naso-pharynx. This is well written and evidently compiled as the result of considerable experience, and an excellent clinical picture of the condition under observation in many cases is obtained.

The concluding chapters deal with the treatment of the various conditions which have already been brought under notice, and the steps of the operations are carefully detailed, and many useful practical points are emphasised. In writing on the subject of the removal of adenoid growths, and in discussing the question of an anæsthetic, Mr. Walsham states that chloroform appears to be attended with special danger in these cases, and should be avoided if possible. It is impossible in a brief review to discuss such a point as this, but we cannot pass by such a statement without some comment. We never employ any other anæsthetic save chloroform, and have always found it most satisfactory, and its administration has not been attended with any special danger.

A. Logan Turner.

Ringworm in the light of Recent Research: Pathology, Treatment, Prophylaxis. By Malcolm Morris, F.R.C.S.Ed. London, Paris, and Melbourne: Cassell & Co. 1898.

Within recent years attention has been specially directed to the topic of ringworm (always an interesting one from its frequency and its intractability, at least in its most common form), by the discoveries of Sabouraud.

These in themselves, scattered through various volumes, or in the more ephemeral pages of periodical literature, have evoked much criticism, support, and a degree of correction. A flood of light has thus been thrown on the nature and mode of growth of the parasites which occasion it. It was desirable, however, that a clear and comprehensible résumé of the whole subject should be provided, for the use of those very numerous members of the medical profession to whom the original treatises and articles are inaccessible. Mr. Morris has set himself to this task, and has accomplished it right well. While preserving all that is of value in the works of Sabouraud and his censors, he has added to this from observations of his own, and has given to the account he has furnished that finish imparted by its being submitted to the action of an independent mind. The work deals solely with the forms of ringworm encountered in Europe, and more particularly in the British Isles. One variety has, however, escaped the notice of this most careful clinical observer, we refer to that known as agminate or conglomerate trichophytic folliculitis, the essential connection of which with the ringworm fungus has been but recently established by Hartzell in America and Sabouraud in France. The descriptions in Mr. Morris' book are so full as to provide an unmistakable picture, and are couched in such easy language that they are delightful to read quite apart from their scientific merits. But when from the clinical, microscopical, and pathological details we turn to the practical part, that of treatment, we find, alas! that we are no nearer the solution of the problem of the rapid cure of scalp ringworm than before. All the remedies which have from time to time been suggested are passed under review, and, notwithstanding the many new introductions, it is shown that we must still rely on our old-tried friends. Morris places chrysarobin in the first rank, then sulphur and mercurial preparations, but *longo intervallo.* This does not coincide with our experience; the second has in our hands proved superior to the first, and without its drawbacks. A large number of very beautiful reproductions from photographs by Mr. Andrew Pringle illustrate the various types of the fungi, and a coloured plate does no more than justice to the stains we owe to the author and Mr. Calhoun.

W. Allan Jamieson.

Manual of Ophthalmic Surgery and Medicine. By Walter H. H. Jessop, M.A., M.B. Cantab., F.R.C.S. London: J. & A. Churchill. 1898.

This pleasantly printed and well-arranged little treatise, dedicated to the students of St. Bartholomew's Hospital, may well become a favourite with students in general, since the reading is easy, the explanations lucid, and the matter full enough for all but those who wish to make ophthalmology their special study. The chapter on "Glaucoma" is particularly simple and clear. So is that on the pupil, a subject in which its author has done well-known original work.

The good advice is given to let the first glasses in presbyopia be weak ones whatever the amount of presbyopia present, "and they can be changed to stronger glasses after the weaker ones have been worn for a few months." An exception, we would suggest, should be made to this in the case of the poor.

Mr. Jessop does not believe in the distant correction of myopia less than 3 D, thinking it lessens the visual acuity without glasses.

This is a matter of judgment, we think, and should be decided by the occupation and needs of the patient. There is no doubt the correction of presbyopia also lessens the visual acuity without glasses, in an equally harmless way, yet no one would withhold correction for that reason, since the sight with glasses is so greatly superior to the highest trained visual acuity without them. In the case of children, especially, it is a part of their education to let them see distant objects clearly. At the same time, it may be well to let the use of glasses be intermittent rather than constant, except for near work, when they should always be worn, as Donders insisted.

Discission of the lens in high myopia is advocated, and also extraction without iridectomy "in all cases of complete cataract, where the patient is not suffering from cough, or any disease which necessitates straining."

The last chapter gives a brief résumé of the more important eye symptoms in general diseases, and the book closes with the now usual appendix of recipes, and regulations for vision-testing of candidates for the public services, and a good index. Though there are a few places in which the volume might be strengthened, Mr. Jessop is to be congratulated on having produced a very readable book, and one which is sure to be appreciated by the circle of readers for which it is intended.

ERNEST E. MADDOX.

On Gall Stones or Cholelithiasis. By E. M. BROCKBANK, M.D. (Vict.), M.R.C.P. (Lond.). London: J. & A. Churchill.

THIS is a small but most comprehensive volume, and includes references to the most recent researches into the chemistry and etiology of gall stones. A compilation of other men's work is easy, but much of the value of the book is the author's criticism and suggestion which we find in almost every section. An elaborate account is given of the clinical features, associated conditions, and diagnosis of cholelithiasis, much of which may be familiar to the practitioner, but in extended form is of great use for reference.

Treatment must always be a difficult chapter to write in dealing with such a subject, because experimental research and clinical experience give very varied and contradictory results. The author's account of his attempts at dissolving gall stones, by means of various agents, in an artificial gall bladder maintained at the body temperature, is instructive.

He does not think that a gall stone once formed into a hard mass can be dissolved by alkalies, but considers, rather, that such remedies benefit by flushing. Salicylate of soda is recommended, and olive oil is strongly advocated; the latter, even in the small quantities in which it can be absorbed, acting as a powerful solvent, and soap is suggested as a suitable remedy in pill form.

Dr. Brockbank, in dealing with the surgery of the condition, expresses a strong dislike to needling the gall bladder or bile ducts, either for

diagnostic or curative purposes, as he believes oozing of bile and resultant peritonitis almost necessarily follow; and for the same reason he deprecates the well-known method of aspirating a distended gall bladder even with a fine needle. A brief index completes a readable and useful work.
ROBERT A. FLEMING.

The Clinical Society's Transactions, vol. xxx. London: Longmans, Green, & Co. 1897.

THE latest volume embodying the papers read and the cases shown to the Clinical Society of London, between October 1896 and May 1897, is full of interesting matter. Many of the papers are surgical in character. The comparatively recent universal *penchant* for the performance of surgical operations in cases of pyloric stricture and tumour is illustrated by Lane's gastro-enterostomy paper, in which two instances of the operation are given, both for cancer, one entirely successful, the other successful but followed by volvulus of the sigmoid flexure, and death nineteen days after operation. In the first case, although two years have elapsed, no sign of the Murphy's button used has been discovered. A pulse rate of 256 per minute is recorded by Herringham in a case of paroxysmal tachycardia in a girl of 11. He is at a loss to account for the frequent, sudden, rapid, cardiac action. (As the child twice suffered from attacks of tonsillitis during the period noted, and the observer hints at former pericarditis, the case may possibly depend on some rheumatic taint, along with prepubertal irritation.) The attacks noted succeeded each other by from thirty-six to fifty-two days (or a mean of thirty-nine days). Another remarkable case is recorded by Ewart and Rolleston, in which an intra-cardiac thrombus, from the *fossa ovalis* projecting through the mitral orifice, gave rise to a mitral obstructive murmur. Many other articles of interest are contained in what is a worthy successor to twenty-nine annual forerunners.
A. LOCKHART GILLESPIE.

Transactions of the Royal Academy of Medicine in Ireland, vol. xv. Edited by JOHN B. STORY, M.D., F.R.C.S. Dublin: Fannin & Co. Ltd. 1897.

THE present volume of these excellent *Transactions* worthily maintains the high level of its predecessors. The number of papers which it contains, and which will amply repay perusal, is much too large to permit of our noticing each individually. Among them, however, without prejudice to the remainder, we might draw attention to those in the Medical Section by Dr. M. A. Boyd, on the "Significance of Dilatation of the Stomach"; by Dr. H. C. Drury, on "Guaiacol in Pyrexia"; by Dr. J. Knott, on "Angina Pectoris"; and an address by Professor His, on the "Development of the Brain." In the Surgical Section, Sir William Thomson's "Some Surprises and Mistakes," Mr. Meldon's "Successful Cases of Tapping the Pericardium," Mr. J. Lentaigne's "Pyloroplasty: Recovery," may be singled out; while in the Obstetrical, Pathological, State Medicine, and Physiological Sections many articles of much value and interest are to be found. The longer the period over which the publication of this series extends, the greater will be the indebtedness of the members of the profession in general to their Irish confrères. A. LOCKHART GILLESPIE.

An American Text-Book of Genito-Urinary Diseases, Syphilis, and Diseases of the Skin. Edited by L. BOLTON BANGS of New York and W. A. HARDAWAY of St. Louis. London: The Rebman Publishing Co. Philadelphia: W. B. Saunders. 1898.

THIS large handsome work in two volumes is the latest addition to the series of "American Text-books" in medicine and surgery. The editors have had the co-operation of over forty contributors, of which the list includes the names of many of the best known writers in the United States. The work, as a whole, may be described as a useful book of reference on the subjects of which it treats. The combination of genito-urinary diseases, syphilis, and diseases of the skin, however useful and profitable it may be in practice, has nothing to recommend it for the purposes of a text-book. While securing all the advantages of rapid production, the collaboration of forty-seven authors tends to the sacrifice of many other desirable qualities. The absence of anything approaching a uniform standard is very striking. One author successfully achieves the task of writing a complete monograph, including the anatomy, development, and malformations of the organ allotted to him, while another plunges straight away into the diseases of the organ concerned. It has apparently been a case of "the willing horse." Certain sections are of the highest possible excellence, *e.g.* those on the prostate, ureter, kidney, syphilis, etc. The information conveyed in the initial chapter on "the urine in surgical diseases of the urinary tract" is elementary and incomplete, especially in the department of bacteriology; this deficiency is not altogether made good by a later article on cystitis by another author. With the large portion of the work devoted to diseases of the skin we have little criticism to offer; here and there the pathology leaves much to be desired; there is no mention of the serum treatment of erysipelas; we searched the index in vain for rodent cancer.

The work is extensively and well illustrated.

ALEXIS THOMSON.

Surgical Technics in Hospital Practice. By K. W. MONSARRAT, M.B., F.R.C.S.E. Bristol: John Wright & Co. 1898.

THIS is an excellent book. It conveys in the clearest and most agreeable manner that information without which the most learned house-surgeon will fail in discharging the duties of his office. In writing this work, Mr. Monsarrat has done good service; we would strongly recommend that a copy of it be presented to every house-surgeon before taking up his residence in hospital, so that he may thoroughly master its teaching and be prepared to practise it—both in the letter and in the spirit.

ALEXIS THOMSON.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
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Artificial Food Preparations.

During the last few years a number of novel preparations have been brought into prominence for the purpose of affording patients, and healthy individuals, opportunities of taking the nutritious constituents of their ordinary food in a more concentrated, easily digested, sometimes semi-, or wholly, predigested form. It may possibly prove of some interest and practical value were the opinions of some authorities upon the utility of these substances grouped together. The various preparations naturally fall to be placed under four groups: those which contain—(1) Proteids only, (2) carbohydrates chiefly, (3) fats chiefly, (4) more than one of the foregoing.

It will be most convenient to arrange the following notes under these headings:—

Proteid Preparations.

1. *General considerations.*—"Sulle preparazioni alimentari artificiali," *Settimana med. d. Sperimentale*, 1897, p. 356; Finkler ("Eiweissnährung und Nährungseiweiss," reported by Camerer, *Med. Cor.-Bl. d. württemb. ärztl. Ver.*, Stuttgart, 11th June 1898); G. Klemperer ("Ueber künstliche Nährpräparate," *Berl. klin. Wchnschr.*, 28th June 1897); Bornstein ("Ueber Fleischersatzmittel," *ibid.*, 22nd February 1897, and "Ueber die Möglichkeit der Eiweissmast," *ibid.*, 5th September 1898); Posner ("Untersuch. über Nährpräparate," *ibid.*, 25th July 1898); and G. Treupel ("Ueber Ernährungstherapie," *München. med. Wchnschr.*, 26th July 1898; "Ueber künstliche Eiweissnährpräparate," *ibid.*, No. 19, 1898), discuss the subject more or less widely. Both Klemperer and Bornstein deprecate too free an employment of artificial proteid foods; they are dear, and from the size of the dose practicable, of little value, compared with natural albumins properly dealt with at home. They regard those preparations which consist of native albumins, either in soluble form or in dry powder, as of more value than prepara-

tions containing proteid derivatives, *i.e.* albumoses and peptone, either entirely or in great part. Treupel, though agreeing with them so far, regards many of the unaltered albumin products as of greater service in certain forms of disease than any home articles, however skilfully made.

Klemperer singles out finely powdered native albunins, or the same bodies in solution, for praise. They can be easily made at home from meat or white of egg, and when thus made are as good as any commercial preparation. He points out that 50 to 60 grms. (1·5 to 1·8 oz.) of proteid are required by the body each day; towards which teaspoonfuls of the artificial fluid food richest in proteid bodies are quite insufficient. Patients are only able to tolerate them in doses which cannot possibly support the body so efficiently as simpler forms, more easily tolerable.

Meat extracts seldom if ever contain more than 20 per cent. of proteid—a teaspoonful of 60 minims containing 12 grs.—while the extractives, present generally in quantity, are harmful to the gouty, to those with kidney disease, and to those with any tendency to stone; while they excite the nervous, and stimulate the circulatory, systems in a marked manner.

Bornstein, after practically supporting these views, notes that only two-thirds of the proteid taken by the mouth can be given in the form of albumose or peptone, if the digestive organs are to be kept free from disturbance.

Posner deals with a method of estimating the constituents of such preparations by means of the colour reactions obtained with the Ehrlich-Biondi triple stain.

I.—Preparations containing Unaltered Native Proteids in a Dry State.—A number of these preparations have been investigated, as Tropon, Nutrose, Sanatogen, Eucasin, and Protogen.

Tropon.—Finkler (*Berl. klin. Wchnschr.*, 21st July 1898); Strauss (*ibid.*, 26th September 1898); Plaut (*Ztschr. f. diätet. u. physikal. Therapie*, 1898, Bd. i.); Schmilinsky u. Kleine (*München. med. Wchnschr.*, 2nd August 1898); Strauss (*Therap. Monatsh.*, Berlin, 1898, Bd. xii. S. 5, quoted *Schmidt's Jahrb.*, Leipzig, 1898).

Tropon is a preparation containing both animal and vegetable albumins in a native, or at least not in a predigested form. It yields 99 per cent. (?) of albumin (Posner); microscopically it appears to be chiefly composed of shreds of muscle fibres and amorphous particles of vegetable albumin; is free from hæmoglobin and fat, and has neither smell nor taste. Tropon (Schmilinsky and Kleine) is a light brown compact powder, insoluble in water, and not hygroscopic; it does not undergo putrefaction when dry. Its smell and taste are hardly perceptible. Nitrogen was present in one sample as 14·28 per cent., equal to 89·25 per cent. of proteid; ash, 1·29 per cent.; fat, 0·11 per cent.; water, 9·35 per cent. In other specimens the proteid varied between 90 and 97 per cent., the cost of which was 40 to 50 per cent. cheaper than the proteid in meat.

Its advantages are, according to Finkler—(1) Ready and cheaply obtained; (2) stable for an indefinite time; (3) easy digestibility; (4) freedom from unpleasant taste; (5) small bulk.

Treupel praises tropon (along with conglutin) for their freedom from unpleasant taste and for their cheapness. But Schmilinsky and Kleine failed to find any great merit in it, save only its cheapness.

Plaut notes, "Albumin preparations can never be more than aids to other articles of diet," and corroborates the statements already quoted as to the value of unaltered proteid preparations, although he regards the numerous records bearing on the successful use of somatose and similar forms of artificially predigested proteid as certain evidence of their frequent value, when given in moderate amount, and not in doses large enough to cause irritation. Employing tropon in a case of heart and kidney disease in 7 grms. (108 grs.) per day for seventeen days, in addition to the ordinary diet, he found that 91 per cent. of the nitrogen taken in, although the intake of nitrogen was nearly double in amount, was made use of, compared with the 86·3 per cent. of the smaller quantity contained in the ordinary food alone. He found the tropon could be given suspended in milk, cocoa, or soup, and best by boiling a small quantity of the fluid made use of, along with tropon (3·5 to 7 grms per diem—54 to 108 grs.), the remaining fluid being added with constant stirring afterwards. As it tends to form a layer at the foot of the mixture, when left for any time, stirring before administration is always necessary. Thirty grms. may be treated thus with 0·5 litre of milk or cocoa, or 20 grms. with that amount of soup to form a "stock." The majority of patients tolerate it well; in others it exhibits symptoms of disagreement. In these the soluble preparations—such as eucasin, nutrose, or sanatogen—may be substituted with advantage. He draws attention, however, to the advantage presented by its cheapness. Finkler, at the International Hygienic Congress in Madrid this year, after a detailed description of the different forms of proteids and their metabolic fate, insisted that the addition of an artificial proteid food, as tropon, to the diet, was not made in order to take the place of the proteids of the food, but to render the food richer in proteid forms. Engel had shown that the poorer classes of Belgium, in 1853, subsisted each day on food containing 46 to 57 grms. of albumin; the richer, with 70 to 75 grms. In 1891 the difference was as 68 to 108 grms per diem. Camerer himself (1898) gives 85 grms. of proteid as the daily mean in Germany. The addition of a cheap preparation rich in proteid, to a diet poor in this class of food elements, must prove of great value. To appreciate Finkler's arguments (*Deutsche med. Wchnschr.*, Leipzig, 1898, No. 17) they require to be read in the original, along with Camerer's (*loc. cit.*) comments on and objections thereto.

A satisfactory encomium is passed on tropon by Strauss, who finds that it does not irritate the stomach or bowel, is easily absorbed, creates no feeling of repugnance, even after it has been given for months, in the majority of patients, and, being of low price, affords an excellent addition to invalid diets, or even may form the chief article of food taken. As 40 to 60 grms. (1·4 to 2·1 oz.) of tropon can easily be made profitable use of in the twenty-four hours, the nitrogen income and the supply of potential body heat can be sensibly increased. Most patients take it best when mixed with milk, a teaspoonful of tropon in 0·5 litre (about a drachm to a pint), or in the form of tropon chocolate or tropon rolls. The nutritive value of tropon is double that possessed by the quantity of meat which can be bought for the same sum.

Nutrose.—Bornstein (*Berl. klin. Wchnschr.*, 22nd February 1897); Marcuse (*Arch. f. d. ges. Physiol.*, Bonn, 1896); Oppler (*Therap. Monatsh.*, Berlin, April 1897); Brandenburg (*Deutsches Arch. f. klin. Med.*, Leipzig, Bd. lviii. S. 71); Neumann (*München. med. Wchnschr.*, 25th January 1898); Stüve (*Berl. klin. Wchnschr.*, 1896, Nos. 20 and 24); Röhmann (*ibid.*, 1895, No. 24).

Nutrose, a compound of sodium and casein, is a tasteless, white, almost odourless powder, which can be taken for long without discomfort or distaste. Oppler states that experiments have shown it to be completely assimilated, to assist in the absorption of the proteids in the food taken with it, and to form a useful means of giving the proteids of milk, while not encumbering the digestive organs by an accompanying excess of milk sugar or fat. No signs of irritation in the bowel are caused; even in cases of diarrhœa it can be given, 40 to 70 grms. (1·4 to 2·4 oz.) of nutrose may be given in the day.

Stüve has chiefly given this caseinate of sodium to children recovering from acute diseases, and concludes that it is absorbed as well and with as much benefit as beef preparations.

Bornstein finds nutrose to be absorbed more readily than flesh, and Kemmerich's peptone less quickly than either. Under identical conditions, nutrose proved much more satisfactory for the bodily metabolism than somatose. Somatose has a pleasanter taste than Kemmerich's peptone, but is prone to set up irritation of the bowel and diarrhœa.

Sanatogen.—Schlesinger (*München med. Wchnschr.*, 1898, Heft 9); Vis and Treupel (*ibid.*, 1898, Heft 9).

Sanatogen is a sodium glycero-phosphate of casein. It is easily soluble in water, and tastes and smells more pleasantly than other casein preparations. Nitrogen is present as 13·02 per cent. It (Vis and Treupel) may be given in coffee, water, or in wine, after neutralisation with bicarbonate of sodium, a teaspoonful with each meal. Sanatogen is a proteid sparer, and, owing to the glycero-phosphate in it, influences proteid assimilation, as Robin and others have shown. Schlesinger ascribes to sanatogen, from the results of a preceding investigation, the property of facilitating the digestion of albumins, and so recommends its use in cases of dilated stomach, chlorosis, heart disease, intestinal catarrh, phthisis, and diabetes. It is well tolerated for long periods even in cases of diarrhœa, and serves as a valuable means of bringing the amount of proteid ingested up to a proper level, in those whose appetite prohibits an efficient consumption of ordinary food.

Vis and Treupel, by actual experiment, found that the loss of nitrogen, *i.e.* the destruction of proteid in the body, was scarcely increased at all when as much as 69 grms. of sanatogen was taken daily, in addition to a fixed diet previously investigated.

Eucasin.—Salkowski (*Centralbl. f. d. ges. Therap.*, Wien, 1896); Laquer (*Berl. klin. Wchnschr.*, 26th October 1896); Nied (*Klin. therap. Wchnschr.*, 1898, No. 13; Laquer (*Wien. klin. Rundschau*, 1897, No. 21); Loewy (*Fortschr. d. Med.*, Berlin, 1896, No. 18); Baginsky and Sommerfeld (*Therap. Monatsh.*, Berlin, Oct. 1897); Weiss (*Wien. klin. Wchnschr.*, 1897, No. 52); Joslin (*Berl. klin. Wchnschr.*, 1897, No. 48).

Eucasin is a fine powder, soluble in hot water, formed by the action of ammonia on casein. Salkowski regards it as superior to somatose, as the latter is often not properly assimilated, and may then cause diarrhœa. He finds that 14 per cent. of the nitrogen in eucasin, and 35 per cent. of that in somatose, is not made use of. Eucasin is best given in vegetable soups, meat bouillon, or in cocoa. It should never be added to wine or beers. Eucasin contains no nucleo-albumin, and is thus permissible in gouty and arthritic subjects, as it does not cause any increase of uric acid. Laquer agrees. Like milk, but unlike flesh, it decreases uric acid excretion. Eucasin is indicated in all cachectic states—in diabetes in convalescence, and especially in the phthisical with distaste for milk. Another advantage possessed by it is its price, five times less than that of somatose. All this is fully corroborated by Weiss, and by Baginsky and Sommerfeld in children.

Laquer in his second paper reports the assimilation of 83 per cent. of the total albumin in the food when eucasin was also given. He finds that it is absorbable in no small degree without change of composition; while Joslin, in cases of gastric ulcer, and in one of carcinoma in which two-thirds of the stomach had been removed, reports increased assimilation of proteid, along with greater loss of nitrogen and fat in the fæces, with eucasin, and also meat peptone.

Nied has found a combination of eucasin and guaiacetin useful in pulmonary tuberculosis, the eucasin rendering the guaiacetin non-irritating to the stomach, and the ready liberation of the antiseptic moiety acting on the diseased processes in the lung. Strauss (*Centralbl. f. innere Med.*, Leipzig, 1896, No. 25) found it answer after the failure of guaiacol itself. Loewy, in a strict metabolic research, found that the administration of eucasin in a case of splenic anæmia lessened the output of uric acid and of alloxuric bodies, suggesting its possible benefit in the treatment of gouty patients.

Protogen.—Blum (*Berl. klin. Wchnschr.*, 6th July 1896; *ibid.*, 23rd November 1896); Deucher (*ibid.*, 30th November 1896).

When a raw egg with unbroken shell is exposed to the vapours of formaldehyde, the yolk coagulates, the white remains fluid, and does not coagulate on boiling. Other albumins, as those of the blood, react similarly. They are probably converted into methylene-albumins, called by Blum protogens. One part of protogen dissolves in ten parts of water, and contains 12·7 per cent. of nitrogen. It may be given by the mouth, by the rectum, or, after sterilisation, hypodermically. In man it appears to favour the retention of nitrogen, and the absorption of fat. Von Noorden in children, and Deucher in adults, have obtained good results from protogen in chronic diarrhœa. In a patient with complete closure of the pyloric orifice from cancer, Deucher found that the following proportions were absorbed, of white of egg, 10 per cent.; nutrose, 17 per cent.; somatose, 20 per cent.; protogen, 30 per cent.

Protogen has a gelatinous taste. In the patient referred to, although there was no secretion of hydrochloric acid, 92 per cent. of the nitrogen, and 85 per cent. of fat, introduced along with the protogen, were absorbed, 78 per cent. and 71 per cent. respectively in the case of somatose.

SURGERY.

UNDER THE CHARGE OF

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Genito-Urinary Gangrene, Peri-Urethritis, and Extravasation of Urine.

Under the title of "Infiltration d'urine et péri-uréthritis," Dr. Jean Escat of Marseilles discusses the changes in the urethra and the peri-urethral tissues, in relation to extravasation and to gangrene. The classical view of the primary lesion, consisting in the sudden rupture of the wall of the urethra under vesical effort, and the escape of a large quantity of urine into the cellular tissue of the perineum, must be reconsidered. Clinical and anatomical observations tend to show that peri-urethral cellulitis and gangrene are the result of septic infection pure and simple, and not from perforation of the urethral wall. In the majority of cases, a gangrenous cellulitis of bacterial origin is the primary lesion, and the extravasation of urine is a result.

In considering generally the subject of gangrene, as it affects the genito-urinary organs, the author finds in these the same predisposition to gangrenous processes as are presented by the mouth, vulva, anus, intestine, and lung. Three clinical types may be recognised, of which the first and second are essentially similar.

1. La forme foudroyante de gangrène génitale, described by Fournier and Emery.—It is met with in healthy young subjects, with normal urine and urinary organs; the gangrene attacks the prepuce, glans, and scrotum, but spares the urethra and corpora cavernosa; it is therefore superficial rather than deep. Its origin is ascribed to streptococcal infection from the prepuce or urethra, the method of entrance usually remaining undiscovered. Recovery is the rule.

2. A superficial form of gangrene, described by Guyon and Albarran, in old debilitated patients with enlarged prostate, who are daily subjected to septic auto-catheterisation. It occurs apart from any extravasation of urine; it is superficial, begins on the prepuce, and spreads to the scrotum, and is usually fatal within a few days. Four different micro-organisms have been identified, of which one is the *Staphylococcus albus.* The urinary origin of the infection is shown by the fact that injection of the urine into the tissues of animals is followed by gangrene.

3. A type of gangrene is described by the author, in which the urethra is mainly involved, and which results from the extension of septic infection from the urethra to the peri-urethral tissues. The urethra may slough partially or completely; on incising in the middle line of the perineum, the urethra may appear black, as if carbonised. Appearing clinically as a diffuse gangrenous peri-urethritis, it may simulate extravasation of urine, and has been erroneously described as such. It is most often met with as the final result of long-standing peri-urethral lesions in patients with stricture. The primary pathogenic factor

is septic infection, and not urinary extravasation, as has hitherto been believed. The author maintains that there is no proof that straining of the bladder may cause rupture of the urethra behind a stricture, and may drive a large quantity of urine suddenly into the cellular tissue of the perineum. Extravasation is always preceded by septic peri-urethritis, which may be purulent or gangrenous; it does not occur in the form of a sudden gush, but drop by drop, just as it escapes from the meatus in over-distended bladder. It is noteworthy that all forms of peri-urethral infection may develop in the absence of any obstacle to the outflow of urine, and may be observed in patients with stricture, who have always been able to pass their water satisfactorily. Post-mortem examination has further shown that the perforation of the urethra may be multiple, and may even be situated in front of the stricture. The number and locality of the perforations are determined by antecedent changes in the urethra and its surroundings, and not by vesical pressure. The idea, therefore, of the dependence of extravasation of urine on over-distension of the bladder must be given up.

When one observes a patient with stricture and retention suddenly develop a peri-urethral swelling, one must not conclude that perforation of the urethra has occurred. It is really a urinary abscess which has remained latent and unrecognised, and has now transgressed its boundaries, and erupted in the perineum. It is causing the retention, instead of resulting from the latter. If the collection be opened, you may find a communication with the urethra, or you may not; in the latter case, the evacuation of the pus frees the urethra from pressure, the bladder recovers its contractile power, and the urine escapes by the natural channel. Similarly, the gangrenous forms of cellulitis, which apparently develop with great suddenness, are really the result of long-standing changes in the urethra and peri-urethral tissues, whereby the normal tissues are replaced by a sclerosed and infiltrated tissue of low vitality. Hallé and Wassermann drew special attention to the wide extent of the changes caused by stricture; the urethra is involved, from the meatus to the neck of the bladder, and from its mucous lining to the corpus spongiosum and peri-urethral muscles. The changes include tissue degeneration, sclerosis, obliteration, endarteritis, and other results of chronic infection. This sclerosed tissue is most liable to succumb to any recent, superadded, more virulent infection, for the occurrence of which it is only necessary that the lining membrane of the urethra should be damaged sufficiently to allow of the passage of micro-organisms. —*Ann. d. mal. d. org. génito-urin.*, Paris, September 1898.

THE TREATMENT OF FISTULÆ OF THE URACHUS.

THE congenital and acquired fistulæ of the urachus present considerable differences in their capacity for healing. Congenital fistulæ are chiefly the result of comparatively slight interferences with the outflow of urine by the urethra, *e.g.* narrowings of the urethra, phimosis, folding of the mucous membrane of the bladder, etc. If the obstacle to proper micturition be removed, the fistula tends to close of itself. More rapid and certain closure has been achieved by excising the urachus, and stitching the gap in the wall of the bladder. Fistulæ, which are acquired later in life, or which have reopened, have been investigated by Luschka, Suchannek, and Wutz. They have found that the lowest portion of the urachus may not become obliterated, and may persist as an epithelial tube in the ligamentum vesicæ medium; a fistula then results, when the valve-like fold of mucous membrane at the bladder opening of the urachus fails to close the latter. Luschka operated successfully in a case of this nature, by excising the fistulous track and stitching up the opening in the bladder. The peritoneal cavity was opened in the course of the dissection.

The differential diagnosis between a fistula originating in the urachus, and one resulting from an abscess in the wall of the bladder, which has burst externally, is very difficult, and may be only possible after microscopical examination of the parts removed at the operation.—E. Lexer, *Centralbl. f. Chir.*, Leipzig, September 24, 1898.

The Closure of Defects in the Skull with Calcined Bone.

Dr. J. Grekoff of St. Petersburg points out that the recognised methods of closing gaps in the skull are difficult of execution, and are not always applicable. He then refers to the observations of Barth, which showed that the successful closure of any gap in the skull depended exclusively on the presence of lime salts in the material employed to close the gap, and that the best and simplest material was calcined bone. It is easily prepared and sterilised, and the process of bone formation, for which the marrow of the surrounding diploë is alone responsible, proceeds more rapidly than with any other material. Apart from experiments on animals, Barth had only tried his method on a case of ununited fracture of the tibia.

The author has employed calcined bone to close the gap in two cases of compound fracture of the skull, in one twenty days, and in the other fifteen weeks after the original injury. The results were completely successful. The bone employed was the scapula of a calf, calcined to a white heat. At the operation the edges of the gap should be pared, and asepsis is indispensable.—*Centralbl. f. Chir.*, Leipzig, 1st October 1898.

Local Anæsthesia by rendering the Tissues Bloodless.

In a previous abtract a description was given of Oberst's method of inducing local anæsthesia, by the combination of cocaine in small amount and the use of the elastic tourniquet. Dr. Kofmann of Odessa has tried the effect of rendering the tissues bloodless without the addition of cocaine, and has been very successful. His first patient was a girl of 16, who had a ganglion on the dorsum of the wrist. The tourniquet was applied round the upper arm. By the time the procedures for sterilising the skin had been completed, the hand was of a death-like pallor, and quite insensitive to touch or pain. The ganglion was dissected out without the patient's knowledge. She complained only of the pain caused by the tourniquet. The author's second patient was a woman with a needle embedded in the hand; here again a deliberate dissection was carried out with similar freedom from pain; quite a series of cases of abscess, whitlow, etc., have been subsequently treated with similar success. If the eyes of the patients were screened off, they did not even know when the operation was commenced. Complete anæsthesia depends on the thoroughness of the elastic constriction of the vessels, and on a sufficient interval being allowed to elapse after the application of the tourniquet. In operating on the fingers or toes, the author has found it better to apply the constrictor above the wrist or ankle, as he has met with gangrene from applying it to the base of the finger or toe. The author regards his method as an improvement on that of Oberst, as it obviates the pain of injecting the cocaine, and the risk of poisoning from the latter. The method is applicable to any operation below the elbow or knee. For the thigh, upper arm, trunk, and head, the author employs Schleich's method of local anæsthesia, and has reduced the number of cases in which a general anæsthetic is required to a minimum.—*Centralbl. f. Chir.*, Leipzig, 8th October 1898.

HYPERTROPHY AND EPITHELIAL NEOPLASMS OF THE PROSTATE.

MM. ALBARRAN and HALLÉ have studied the pathological anatomy in eighty-six cases of hypertrophy of the prostate, and have come to the following conclusions. The primary and essential lesion involves the glandular tissue of the prostate. The greater part of the hypertrophied organ consists of altered, hypertrophied, dilated, and proliferated gland lobules. The changes in the fibro-muscular stroma are accessory and secondary; they are often partial and nodular; it is exceptional for them to predominate to such an extent as to obscure, and to cause to disappear, the glandular element.

The authors find a striking analogy between the hypertrophied prostate and chronic interstitial mastitis. The glandular lesion in the prostate may be regarded either as a true, innocent adenoma, or as the result of a chronic inflammation which is attended with proliferation of gland tissue, with or without a corresponding reaction in the stroma.

In a certain number of cases which definitely belong to the group of innocent senile enlargements of the prostate, they have observed more advanced glandular new growths, presenting the histological characters of malignancy. These were found in twelve of the eighty-six cases examined. In two of them the new growth was of recent development, in the form of one or two small, well-defined lobules, presenting the typical structure of "adenoid epithelioma," in the midst of the innocent gland lobules which constituted the greater part of the hypertrophied organ. In two other cases similar lobules of "adenoid epithelioma" were found, only larger and more numerous. In four cases they observed in the vicinity of the lobules of "adenoid epithelioma" an infiltration of the surrounding stroma, in the form of irregularly arranged columns and clumps of epithelial cells. In one of these cases the malignancy of the new growth was demonstrated by epithelial invasion of the lymphatic sheaths of the peripheral nerves of the prostate and of the nerves themselves. In other two cases there was a diffuse epithelial infiltration of the stroma, side by side with the innocent gland lobules. Lastly, in the two remaining cases, innocent and malignant gland lobules, epithelial infiltration of the stroma, and more advanced forms of circumscribed alveolar cancer, were found in varying proportion in the hypertrophied prostate. The preceding lesions were found in more than 10 per cent. of the cases examined, without any alteration in the usual microscopic appearances of the organ. From the diversity in type of the epithelial changes in different cases, or it may be in the same case, there may be assumed to exist all degrees of malignancy, from the simple, innocent adenoma, so common in the hypertrophied prostate, to alveolar cancer. Between the innocent hypertrophy and the diffuse prostato-pelvic cancer two intermediate forms must be recognised, the "adenoid epithelioma" and the intra-capsular alveolar cancer, described by Socin.

In these cases the prostate may not exceed the ordinary size of the hypertrophied organ; its consistence and macroscopic characters do not differ from those in the innocent hypertrophy, and yet in several one may discover cancerous infection of the lymphatic glands and metastases in the viscera. Clinical observations harmonise with these pathological investigations. Cases are observed in which the typical symptoms of innocent senile enlargement of the prostate are present for many years; then the scene changes, and the physical signs and symptoms of cancer make their appearance. They cite the case of a man, æt. 66, who presented the ordinary symptoms of prostatic enlargement for five years. The prostate was uniformly enlarged, as felt per rectum; the median lobe projected into the bladder, causing retention; it was removed by the suprapubic operation in January 1898; microscopically it presented the usual structure of innocent hypertrophy; two years later, the patient died of typical cancer of the prostate, with infection of the iliac lymphatic glands.

The authors' conclusions from the foregoing observations are as follows:—Senile enlargement of the prostate is an essentially glandular lesion. As a rule, it maintains for a long time or until death the characters of an innocent adenomatous proliferation. In a notable proportion of cases, however, it may be transformed into a malignant epithelial growth, insidious and latent in its development, but ultimately assuming the characters of a typical cancer. The successive stages of the evolution of cancer in senile enlargement of the prostate are—innocent adenoma, circumscribed adenoid epithelioma, epithelial infiltration of the stroma, intra-capsular alveolar cancer, and finally diffuse cancer.—*Ann. d. mal. d. org. génito-urin.*, Paris, August 1898.

OBSTETRICS AND GYNÆCOLOGY

UNDER THE CHARGE OF

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Removal of the Uterus and Appendages per vaginam, for Chronic Inflammatory Disease of the Appendages.

Bushbeck (*Arch. f. Gynaek.*, Berlin, Bd. lvi. Heft 1) has investigated the results obtained at the Dresden Clinic, from the removal of the uterus and appendages for chronic inflammatory conditions of the ovaries and tubes. Only the cases in which palliative treatment had been thoroughly tried and had failed were selected.

Sixty-seven cases in all were operated on, with one death. Two subsequently died from other causes, while sixteen were lost sight of. The remaining forty-eight were communicated with, and it was ascertained that thirty of these were in good health and free from pain, and eighteen had more or less disagreeable symptoms, but were much better than before operation. The intervals since operation varied from twelve years to one year or less. The author considers that these results amply justify this method of operation.

Acute Inversion of the Uterus following Parturition.

Dr. W. S. Stone (*Am. Journ. Obst.*, N. Y., August 1898) describes a case of acute inversion of the uterus following parturition.

The patient, a primipara, had been married three years; she had always been delicate, extremely nervous, and had suffered from dysmenorrhœa. After marriage she suffered from vaginismus, for which she was treated. She was very nervous during pregnancy, and apprehensive of labour. The membranes ruptured early, and when first examined the os was three-quarters dilated; the presentation and position were normal; up to this stage she had had no pain. About twelve hours later she was in the second stage, and had fairly strong uterine contractions, and in an hour and a half the head reached the pelvic floor, when the pains became fewer and weaker; and as the patient showed signs of exhaustion, labour was terminated with forceps, under chloroform anæsthesia. The perineum was torn, and the cord, which was twisted round the neck once, was released with difficulty. There was slight hæmorrhage, which was easily checked; but on attempting to express the placenta the uterus could not be felt through the abdominal wall, and on examination per vaginam it was there found with the placenta adherent to it. The latter was with difficulty removed, when all hæmorrhage ceased, and several futile attempts were made to reduce the inversion. A consultant was sent for, who arrived in an hour, when renewed attempts were made at reduction. These were unsuccessful, and the patient sank and died two hours later. In discussing the etiology of this rare condition, the author quotes Beckman, who concludes from 100 tabulated cases, recorded between 1885 and 1895, that the spontaneous origin is more frequent than is generally supposed, and that fifty-four of his cases were of spontaneous origin; in twenty-one cases violent measures had been used; while in the remaining twenty-five the description was too meagre to ascribe a cause. He believes that relaxation of the entire or part of the uterus is necessary for spontaneous inversion to occur.

Congenital Laceration of Cervix.

Heil (*Centralbl. f. Gynäk.*, Leipzig, 1898, No. 19) reports three cases in which he discovered cervical lacerations in nulliparous women. In one case the tear extended well into the parametrium. While the cases are of no clinical value, he holds that they are of great forensic importance, as lacerations of the cervix are considered evidence of previous confinement.

The Bacteria of the Vagina and their Clinical Significance.

Williams (*Am. Journ. Obst.*, N. Y., October 1898, p. 449), after reviewing in a practical manner the work of Doderlein, Krönig, and others on this subject, tabulates a series of ninety-two cases which he investigated himself, and from which he arrives at the following conclusions :—(1) The vaginal secretion of pregnant women does not contain the usual pyogenic cocci, having found the *Staphylococcus epidermis albus* only twice, but never the *Streptococcus pyogenes* or the *Staphylococcus aureus* or *albus*. (2) The discrepancy in the results of various investigators is due to the technique by which the secretion is obtained. (3) As the vagina does not contain pyogenic cocci, auto-infection with them is impossible; and when they are found in the puerperal uterus, they have been introduced from without. (4) The gonococcus is occasionally found in the vaginal secretion, and during the puerperium may extend from the cervix into the uterus and tubes. (5) It is possible, but not yet demonstrated, in very rare instances, that the vagina may contain bacteria, which may give rise to sapræmia and putrefactive endometritis by auto-infection. (6) Death from puerperal infection is always due to infection from without, and is usually due to neglect of aseptic precautions on the part of the physician or nurse. (7) Puerperal infection is to be avoided by limiting vaginal examinations as much as possible and cultivating external palpation. When vaginal examinations are to be made, the external genitalia should be carefully cleansed and disinfected, and the hands rendered as aseptic as if for a laparotomy; vaginal douches are not necessary, and are probably harmful.

The Surgical Treatment of Irreducible Retroflexion of the Gravid Uterus.

Dr. Mann (*Am. Journ. Obst.*, N. Y., July 1898) states that in cases of incarcerated retroversion of the gravid uterus, when all attempts at replacement per vaginam have failed, that instead of inducing labour, abdominal section should be performed, and the fundus pulled up by the hand introduced behind it. He holds that if the uterus completely fills the pelvis, attempts at replacement from below must fail, not because the uterus is too large to be forced through the pelvic brim, but, filling as it does the pelvic cavity when it is pushed up, nothing can enter from above to take its place; and the moment the hand is removed from below, atmospheric pressure forces the uterus down into its former position. Even if the uterus be soft and yielding, considerable manipulation is required to get it up, and this can only be accomplished by allowing air to get in behind it. In addition, if adhesions be present, these must be broken down before reposition can take place, and this can only be done by operation. He illustrates his article by two cases, in both of which, after several attempts had been made at reduction per vaginam, unsuccessfully, the abdomen was opened, and the incarcerated uterus, with considerable difficulty, lifted out of the pelvis. Both patients recovered; one had a natural labour at full time, the other was lost sight of. The author refers to a similar case recorded in the *Brit. Med. Journ.*, London, 1896, vol. xi., by Dr. Murdoch Cameron of Glasgow, of any previous investigations regarding it.

On the Treatment of Stomach Ulceration.

Czygan divides the period of treatment into three [illegible] (1) When the symptoms are severe—bleeding, severe [illegible] being present; (2) when these have been much lessened; (3) [illegible] subjective symptoms have passed off, but objective symptoms [illegible] sist. Regarding the first stage he has little to add to the almost [illegible] practice of complete rest and sedative treatment generally. In [illegible] hæmorrhage he uses morphine with atropin subcutaneously [illegible] remedy. In the second stage, while giving abundance of food, [illegible] necessary to attend to the rapid emptying of the stomach, [illegible] irritate it or cause pain, and this is best accomplished by [illegible] bowel empty by means of oil or water enemata, or by gentle purgatives. The food should be given frequently, in small quantities and of soft consistence. Magnesia given after each meal lessens the acidity, and any food which tends to increase it—such as too hot or too cold, sour, or highly spiced meats—should be avoided. Plenty of flesh should be given, and carbohydrates in more limited quantity; at first the meat is given raw and shredded, and gradually is more thoroughly cooked. Milk and eggs are avoided at this time. Sometimes the former is well borne, but often just the contrary.

In the third period, when pain has completely disappeared, begins the most important phase of the treatment. The gastric acidity and rapidity of digestion should be carefully ascertained by the usual methods, and almost always very great departure from the normal is found. As long as there is hyper-acidity, the ulcer, even if cicatrised, is apt to return. Much more active measures may now be undertaken, such as massage and electricity applied directly to the stomach, and these, along with general exercise, tone up its muscularity. If there is much gastroptosis, a bandage should be worn. The food should be very abundant but digestible, and special attention should be paid to the bowels. Strychnine assists in restoring the muscular activity of the gastro-intestinal walls. The acidity gradually sinks to normal in one or two years, and relapses then seldom occur.

In treatment the great point is not only to cause the ulcer to cicatrise, but still more to restore the normal acidity and movements of the stomach.—*Therap. Monatsh.*, Berlin, September 1898.

Action of Different Anæsthetics.

Thompson and Kemp (*Med. Rec.*, N. Y., 3rd Sept. 1898) have studied the effects of ether, chloroform, A.C.E., and other mixtures on the general circulation and that of the kidney simultaneously. Dogs were used for the experiments. Ether always raised the general blood pressure, even when pushed, and there was a fall as soon as the administration was stopped. On the other hand, it depresses the kidney circulation, the secretion of urine is diminished *ab initio*, and may finally cease entirely. Albuminuria was induced in every case. Under chloroform there was a slight rise in the blood pressure for a few seconds, followed by a marked and continuous fall. The kidney circulation closely follows, the renal secretion remains copious in amount, and only diminishes when the general circulation becomes greatly depressed. Albuminuria only appeared after deep and prolonged narcosis, and then only very slightly.

A.C.E. mixture, when administered by the open method, showed the effects of ether on the general circulation; but if by the closed method, there was a very pronounced chloroform effect. As regards the kidney this was reversed. The renal secretion is more copious than with pure ether, but less than with chloroform. Albumin is generally present. With nitrous oxide there is no effect on the general circulation, unless the administration is pushed to an extreme extent. There is no specific effect on the kidneys, which simply share in the action on the general circulation.

The authors conclude that ether has a specific action in contracting the renal arterioles, with consequent damaging effects upon the renal secretory cells, similar to those which follow clamping of the renal artery. The kidney shrinks in bulk, there is diminution of secretion, and albuminuria. These results seem to contra-indicate the use of ether in renal disease. The effect of chloroform on the kidney seems to be nil. They hold that the A.C.E. mixture has no advantages, but rather the reverse, and that any mixture of anæsthetics is a mistake in practice.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

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The Orbital Manifestations of Sinusitis.

In some patients affected with inflammation of the frontal sinus, attacks of neuralgia recurring at intervals, especially in the morning, and in a number of cases almost at a certain hour, form an important and rather peculiar symptom. These neuralgic attacks are characterised by continuous pain with violent exacerbations, in which the whole region presided over by the ophthalmic nerve is involved, the pain darting all over that area. There are at the same time injection of the conjunctiva, lachrymation, and photophobia, all of which become redoubled on any attempt to accommodate. The attack lasts a few hours, then passes off, only to be renewed next morning. In presence of such symptoms, which are not infrequent after influenza, one ought always to be on one's guard lest inflammation of the sinus be present, and not merely a simple neuralgia.

There is also the chronic form of the same affection, in which the walls gradually yield to the internal pressure, and the sinus begins to encroach on the orbital cavity. In these cases a fistula is apt to persist for long after either incision or spontaneous extravasation of the contents; in fact we see the same march of symptoms that we do in inflammation of the lachrymal sac: where the lesion has been acute,—complete and sound healing; but where repeated or chronic dacryocystitis has occurred, a more or less permanent fistula.

Inflammation of the maxillary or other neighbouring sinuses is frequently enough followed by suppuration of the cellular tissue of the orbit, to which the affection may have spread either by venous or by lymphatic paths; but besides those cases, others occur, less easily understood, in which, subsequently to a maxillary sinusitis, and without any apparent orbital cellulitis, restriction of the field of vision, optic atrophy, or irido-choroiditis arises. In such a state of affairs the presence of a sphenoidal sinusitis may be suspected.

Three points, then, deserve our attention—(1) The possibility of the intermittent pains of a sinusitis simulating an ordinary facial neuralgia, but having a decided injurious effect upon the ciliary nerves; (2) the apparent severity of the very acute cases, leading to abscess of the orbit, and casting off of sequestra of considerable size, but yet terminating in a comparatively easy cure without leaving a fistula; (3) the great difficulty of avoiding the establishment of a fistula in the chronic cases.—De Lapersonne, *Arch. d'opht.*, Paris, June 1898.

EXTRACT OF CILIARY BODY, ETC., AS A THERAPEUTIC AGENT.

SOME time ago in this Journal (September 1897) we referred to the fact that extract of the ciliary body of the ox had been employed in the treatment of chronic cyclitis. Lagrange has been using it along with a solution of the vitreous humour, and has obtained "encouraging results." The substance, which is known by the name of oculine, is prepared (briefly) thus: Under antiseptic precautions, the ciliary body and the vitreous humour, obtained from the eyes of the ox, are mixed with sterilised glycerine, in the proportion of one part of "eye" to two of glycerine; this mixture remains for six hours, being shaken from time to time, until thorough solution of the vitreous body is obtained. A quantity of water equal to that of glycerine is then added, so that there is now one part of "eye" to five of fluid. It is then twice filtered. The liquid thus obtained is yellowish and quite clear, and is used for administration by the mouth. When it is required for subcutaneous use, equal parts of "eye" and glycerine are shaken together, and left for six hours. Another equal part of sterilised physiological serum is added; thus a strength of 1 in 3 is obtained, which is then filtered. This is now ready for subcutaneous use, or may be further diluted with water and taken by the mouth. As regards the results obtained by the use of these solutions, Lagrange employed them first in two patients (an old man and a child), who had lost a large amount of vitreous humour during the extraction of cataract, and believed that he had obtained benefit. In the older patient, eight months after the operation, the tension had returned to normal, and there was no detachment of the retina; his vision was but poor, but that was partly due to a severe iritis, with much exudation; the loss of vitreous humour had been the worst which Lagrange had encountered. In the case of the younger patient, vision and the condition of the eye were eventually very good. This method of treatment was used also in three cases of detachment of the retina; in the first of these the cause was traumatic; the patient, a young girl, only retained a fragment of the field, and practically no vision. She was treated by rest in bed, puncture of the detached retina, and was given 3 drms. of the above solution per diem by the mouth for one month. The result was excellent: the field of vision became nearly normal; at the end of the month only the lower portion of the retina remained detached, vision rose to one-eighth, and did not again deteriorate. A second case did equally well; but a third —a spontaneous detachment in a myope—obtained no improvement whatever. In a fourth case excellent results were obtained: vision rose from one-fifteenth to four-fifths, and the field expanded to the normal limits.

Lagrange is much encouraged by such cases, and intends to continue this mode of treatment. He has lately been applying opotherapy still further by treating cases of corneal nebula by subconjunctival injections of an organic fluid, made by macerating fresh corneæ (of the ox) in distilled water! He promises to publish the conclusions to which the progress of such cases may lead him.—*Gaz. hebd. d. sc. méd. de Bordeaux*, 25th September 1898.

Total Keratectomy.

As in other branches, so in ophthalmology, surgery is tending to become more and more conservative; we no longer enucleate eyes which are injured, for example, so freely as once was the rule. The operation which Panas here recommends is applicable chiefly to that large class of eyes which are blind from staphyloma of the cornea, or from chronic malignant glaucoma, and which so often have to be removed altogether, in order simply to give relief to the patient from the tormenting pains which persist even after vision is quite gone. Panas cannot be accused of a hasty adoption or recommendation of his method, for he allowed nine years to elapse between his first and second cases, in order to be quite sure of the permanence and solidity of his result. The first case was that of a student, who lost his whole cornea from acute ophthalmia, and who now, at a distance of seventeen years from the date of the operation, obtains a perfectly quiet, non-irritable, sound stump, which retains its volume and its mobility. The method of procedure is briefly as follows:—The patient being under chloroform (in order to prevent any expulsive movements), the limbus corneæ is transfixed with a half-curved needle, which is passed behind the iris and lens; this needle is threaded with a silk thread, which will eventually become the central stitch, but it is not as yet drawn through. The cornea is now cut off at its base by means of a Graefe knife, at the junction of the transparent with the semi-opaque portion of the membrane, the last portion of the incision being finished with scissors. In a staphylomatous eye the most of the iris, being adherent to the cornea, is thus cut away; but any remnants, and, in the case of glaucoma, the whole—as yet untouched—iris is now removed. The lens, whether cataractous or not, is now removed entire with the spoon, and in order to prevent any avoidable loss of vitreous while this is being done, the speculum is held well forwards by an assistant. The needle is now drawn through, and the thread knotted, and a similar suture introduced on each side of the original one. In order to avoid having "corners" when the edges are drawn together, it is necessary to cut off the angles to right and left with scissors. The stump is then dressed in the usual way, the stitches are removed about the seventh day, but the bandage is kept on for another eight or ten days after that. Healing is quite placid, any pain previously present disappears, and the patient finds great relief. The chief advantages which Panas claims for this method over the operation of abscission (Critchett), with which it must not be confounded, are that the cornea alone of the coats of the eye is cut off; that the iris is removed entire and the lens extracted; and that thus the ciliary body, the choroid, and, if possible, the vitreous humour, are left completely untouched. There are thus no injurious hæmorrhages into the stump; the globe only loses about one-fifth of its volume, or perhaps one-fourth; and by the complete opening up of the angle of the anterior chamber by the removal of the iris and of the lens, it is almost impossible but that all glaucomatous symptoms shall vanish. The retention of a comparatively large globe is of great value in children, in preventing faulty development of the face. Nor does the patient run any of those risks which are involved in the introduction of a false vitreous humour made of glass, sponge, silver, or other substance, as in the operation introduced by Mules.—*Arch. d'opht.*, Paris, Sept. 1898.

Strabismus in Persons with Hereditary Syphilis.

Antonelli has observed a certain relation between hereditary syphilis and strabismus, and concludes an article on the subject, stating his opinions in the following manner:—1. In a considerable number of cases, strabismus has its causes of origin in certain hereditary influences, infectious or toxic in their nature, among which inherited syphilis is of maximum importance. It is certain that a number of children owe their squints solely to the fact that their parents have suffered from syphilis. In fact, fully a half of all young persons with hereditary syphilis squint. 2. This congenital taint may produce strabismus in a variety of different ways—(*a*) Lesions of the *sensory* portion of the binocular visual apparatus, which interfere with the simultaneous excitation of the cerebrum by the two retinal images, even when acuity of vision is fairly good and approximately equal in the two eyes. This lesion is analogous to certain others which affect the higher central functions, lesions which in this and other disorders so frequently produce those delays or hindrances of reaction of all sorts. (*b*) Lesions of the *motor* portion of the mechanism of binocular vision, or of the connecting links between the sensory and the motor sections. These troubles, among which must be included the intercurrent paralysis or paresis of accommodation described by Javal, interfere with the working of the mechanism of the convergence reflex, which is the essential apparatus of binocular vision: they may be regarded as analogous to the troubles of co-ordinated reflex motility, which, among persons suffering from this or any dystrophy, so frequently are found to produce that stammering or hesitation of articulation, in spite of the integrity of the peripheral organs of speech; or that delay, that inability to "set out" walking, where it happens that the lower limbs are affected, even when the limbs themselves, peripherally speaking, are to all appearance quite normal. (*c*) Manifest lesions of the *ocular* apparatus, properly so called,—grave affections of the transparent media, retina, and choroid; and also, and more particularly, astigmatism and congenital mal-development of portions of the fundus. These lesions may produce their effect either by rendering the macular image a very imperfect one (by astigmatism or intransparency of the media), or by causing it to be very imperfectly appreciated or perceived (by alteration of the optic nerve, choroid, or retina). Under these circumstances, the contemporaneous excitation, which should be at least approximately equal and accurate in the two eyes, will be lacking, that excitation which is the retinal element in the mechanism of the simple visual reflex. In these cases, if the acuity of vision be somewhat defective, but at the same time approximately equal in the two sides, a reflex of direction merely, and not a true reflex of convergence, will be set up in each eye; but, on the other hand, if one of the eyes enjoys superior vision to the other, in that eye will be set up the reflex of fixation,—it will become the "fixing eye," the reflex of convergence or of distance will not be established, and the more imperfect eye will, with certainty, deviate and take up a faulty attitude—in short, will squint.

Antonelli in a series of years has found that fully 50 per cent. of the children who squint are also syphilitic.—Antonelli, *Arch. d'opht.*, Paris, October 1898.

Some Questions still Unanswered regarding Cataract.

In an article dealing with certain points still requiring elucidation, but which do not all require notice in this place, Grandclément advocates careful bathing of an eye at intervals during one or two days previous to operation. Not only, he says, does he by this means succeed to a large extent in removing the germs which are known to be present even in the normal conjunctival sac, and so sterilises the *terrain*, but he believes that the mechanical stimulation and irritation of parts produced by the vigorous application of the antiseptic produces an exaltation of vitality and of the means of defence against microbes, and more particularly against their toxins: "It is certain that tissues so stimulated are preserved by a diapedesis and a phagocytosis more active and more powerful." The author even states that he has observed that patients who have an issue or seton in the arm—who are more numerous than one is apt to suppose—heal with very great rapidity and almost without secretion; he considers that the seton exercises an attractive power upon the toxins, and so saves the eye from danger. He is in favour of washing out the anterior chamber to remove fragments of lens substance, and does not hesitate even to reopen the wound two or three days after operation, if, on the first occasion of dressing the eye, he finds that in spite of such injections the pupillary area contains much débris of lens matter.

In most of these points, Grandclément's views and experience are at variance with those of other surgeons.—*Lyon méd.*, August 1898.

Metastatic Carcinoma of the Choroid.

It is a great rarity to meet with a true carcinoma of the choroid, and the case which Lagrange records is only the twentieth of which he has been able to find any description in literature. It was that of a married woman of 48, who had had the left breast excised on account of cancer (verified by microscopic examination) three and a half years previously; this had been followed by two local recurrences, both operated upon. By the time the patient first noticed anything amiss with the right eye, it was quite blind, but as there was no pain, and as she was in a very bad state of health, she took no steps till four months later, when severe pain obliged her to consult her medical adviser; the eye was then found to be in a state of acute glaucoma. Over about one-third of its extent the angle of the anterior chamber was abolished; at one part the iris was thickened, and displayed a neoplasm growing from its substance; the retina was seen to be detached, but ophthalmoscopic examination was very difficult, owing to the turbid state of the media. The eye was removed, not in the hope of doing any permanent good to the patient's health, but simply to free her from her violent pain; she died with symptoms of metastasis in the spinal column and other situations, about three months later. In the majority of the cases already upon record, as well as in the present, it is the right eye which has been affected, and the outer half of the posterior portion of the choroid has usually been the precise seat. It has been supposed that, owing to the anatomical relations of parts, it is easier for the embolism to enter the right than the left carotid artery, and to find its way by the short posterior ciliary vessels, and the more abundant blood supply of the temporal side of the disc will account for its position near the macula. The evil progress of such cases seems always to be very rapid, the patients being generally in an exhausted and cachetic condition before this development occurs. The original seat of the cancer has nearly always been the mamma, but the primary tumour has also arisen in the stomach, thyroid body, and lung; why has it never been the rectum, uterus, liver, or tongue? The great preponderance of the mamma as the original seat is attributed by Lagrange (somewhat fancifully, as it appears to us) to similarity of tissue on the part of breast and choroid. In presence of the original tumour, the diagnosis presents no serious difficulty, the symptoms and signs being exactly similar to those of the more ordinary tumour (sarcoma) of the choroid, of which the clinical description would serve for that of carcinoma.—*Arch. d'opht.*, Paris, January 1898.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society.—*2nd November* 1898.—Dr. **Craig**, in the absence of Sir **John Batty Tuke**, presided.—Mr. **Alexis Thomson** showed a patient from whom he had excised a large pyloric carcinoma, according to the method employed by Kocher. The tumour was so large as to cause a visible swelling on the abdominal wall. The patient made an uninterrupted recovery.—Dr. **Allan Jamieson** showed a patient suffering from tylosis and nævus neuroticus.—Dr. **Aitchison Robertson** showed a large tonsillar calculus.—Dr. **James** read a paper on tubercular neuritis, and included under this term inflammation of any part of the nervous system. The symptoms are very varied. Thus there may be sensory disturbances, muscular atrophy, herpes, etc., according to what portion of the nervous system is affected. The symptoms show a tendency to disappear and to reappear elsewhere. In some cases there is quite a sudden commencement. The causeless hemiplegias of tubercular subjects may be due to a poisoning of the affected tract of nervous tissue by tubercular toxin. The convulsive attacks in tubercular meningitis are also possibly due to tubercle toxin. The mental stupor of dying phthisis cases is probably due to tubercular toxin poisoning. Patients suffering from phthisis are more susceptible to malaria and alcohol than they were when in health, and thus a neuritis may easily be brought on in them.—Dr. **Robertson Dobie** read a paper on a case of acute yellow atrophy with recovery, which appears in this number of the Journal.

Edinburgh Obstetrical Society.—*9th November* 1898.—Dr. **Halliday Croom**, President, in the Chair.—The **President** delivered an address on "Surgical Interference in Gynæcology," which appears in this number of the Journal.—Dr. **Milne Murray** read a note of a case bearing on the "Latency of Gonorrhœal Infection." A child, two days after birth, developed in one eye an attack of ophthalmia, evidently gonorrhœal in nature, and later the other eye was similarly affected. The mother had previously had two normal confinements, the children being healthy and showing no signs of gonorrhœal infection. The father confessed to an attack of gonorrhœa eight years before, but for some time before his marriage he had been absolutely well. Since then he had shown no signs of the disease, nor had his wife. Dr. Murray referred to the weak points in the case, namely, the veracity of the father and the absence of bacteriological proof that the ophthalmia was gonorrhœal; but neither of these he doubted, and he could only conclude that the case was one of latent gonorrhœa, showing itself in the third child eight years after the infection of the father.

Royal Medical Society.—28*th October* 1898.—Dr. G. Chiene in the chair.—Dr. R. Purves showed a case of chronic enlargement of the submaxillary lymphatic glands, in which microscopic examination gave no definite results. Also a case of double knock-knee, with dislocation outwards of both patellæ.—Mr. Miles showed the skull of a man, embedded in which was a large piece of iron wheel, which had broken when in motion. On extracting this, the hæmorrhage was so great that plugging could not arrest it, and the common carotid on the same side was ligatured. Patient was sent back to bed, but very shortly afterwards began again to bleed profusely. Mr. Miles then ligatured the other common carotid, and the hæmorrhage again ceased. Patient survived this operation nine hours. He also showed specimens from a case of enlarged prostate, in which one testicle was very much smaller than the other. This was caused by the pressure of a long-standing inguinal hernia on that side. The prostate was found to be atrophied on the same side as the atrophied testicle. He also showed specimens of cancrum oris, cancer of rectum in a boy of 12, perforated duodenal ulcer, and several beautiful casts of various conditions.—Dr. Scot Skirving showed—(1) Case of ectopic perineal testicle; (2) case of very large ischial bursa; (3) case of inguinal hernia containing cæcum and appendix.

4*th November* 1898.—Dr. M'Nair Scott in the Chair.—Dr. Boyd Jamieson showed a case of punctured wound of the abdomen, with laceration of the gut, in a boy.—Dr. Cooper described a case of hydatids of the liver cured by operation.—Dr. Graham described two cases of intestinal obstruction—Case 1, caused by a seemingly congenital narrowing near the ileo-cæcal valve; Case 2, caused by a hernia through a tear in the gastro-hepatic omentum.—Dr. M'Nair Scott (senior president),—Dr. Cooper, Dr. Herring, and Dr. F. B. Simpson were elected presidents.

Glasgow Medico-Chirurgical Society.—21*st October* 1898.—Dr. Middleton in the Chair.—Dr. W. K. Hunter showed—(*a*) A child with hemiplegia associated with diphtheritic paralysis. Soon after an attack of diphtheria there was paralysis of the left side of the face, and a few days later of the left arm and leg. The soft palate was also found to be paralysed, and the pupils were widely dilated. The mode of onset of the hemiplegia excluded a diphtheritic origin. (*b*) A boy suffering from the *maladie des tics*, which commenced at the age of 7, and was brought on by fright. The spasms were very general, and voice spasms were present.—Dr. James Carslaw showed a woman of 24, suffering from a painful swelling of the legs, resembling erythromelalgia. The pain was paroxysmal.—Dr. R. S. Thomson then read a paper on a disease occurring in Lascars, having relations to variola and varicella, but differing from both in certain points.

4*th November* 1898.—Dr. Middleton in the Chair.—Dr. J. H.

Nicoll showed a patient upon whom he had successfully operated for cerebellar abscess, accompanied by middle-ear disease.—Dr. Beaton showed a cystic goitre removed by excision, and a fatty tumour removed from the superior mediastinum.—Dr. Adams and Dr. J. H. Nicoll each showed a large meningo-encephalocele removed by operation, and Dr. Nicoll showed a nævoid tumour of the intestine, enclosed in double intussusception, which was successfully resected.

The Forfarshire Medical Association. — Met in University College, Dundee, *2nd November* 1898.—Dr. J. Mackie Whyte, Vice-president, in the Chair.—Dr. Whyte showed a cirrhotic liver and a stomach with cancer of the cardiac end, from a patient who had developed acute peritonitis.—Dr. Greig showed—(1) A cast of the head of a microcephalic idiot whose age at death was 21; the measurement from glabellum to lesion was 12 in.; (2) a cast of the head of a prognathous idiot whose age at death was 35; (3) cast of a hypertrophied prepuce following phimosis; (4) a cast of a foot after Mikulicz's operation; (5) an osteoclast for the treatment of genu valgum.—Dr. Rogers read a paper on œdema neonatorum in a child born at the eighth month, with symptoms of this disease beginning on the third day. The child was never able to suck, and œdema of the hands and feet appeared. There was a systolic murmur at the apex, and distant breath sounds at the base of both lungs. The urine contained no albumin. The spleen and liver were enlarged. On the eighteenth day acute enteritis set in; after recovery from this the œdema disappeared, and the child is now well and putting on flesh.—Dr. M'Vicar read notes of a gastrostomy, performed for cancer of the cardiac end of the stomach, on a woman, æt. 53. The stomach tube could not be passed into the stomach; on withdrawing it there was blood and colloid material at the end of it. Dr. M'Vicar made an opening into the stomach by Frank's method. Up to the third day after the operation there was sickness and retching, and later there was some trouble owing to leakage; otherwise, the patient had done well till three months after the operation, when pain immediately on receiving food again troubled the patient. This, Dr. M'Vicar thought, was due to extension of the disease.—Dr. Buist read a paper on the treatment of ineradicable cancer of the uterus by interference with the blood supply, giving an account of a case in which he had ligatured the uterine arteries and removed the ovaries. This treatment caused a diminution in the discharge, but apparently very little alteration in the rate of growth of the disease. He showed the bladder, uterus, and rectum, which were all involved to some extent in the growth.

ANALYTICAL REPORTS.

Benoist's Invalid Specialities.

Investigation into the merits or demerits of the jellies and other articles, forwarded by the well-known firm of Benoist, had to take the agreeable form of actual consumption. The verdict of our palate was most favourable. The Gelée à l'Oranges and Gelée à les Citrines were clear, fresh, delicately flavoured, and turned out of the jars in perfect condition. Only one addition was necessary, a little wine while they were in fluid form. These jellies are supplied in glass jars, hermetically sealed in an ingenious manner, although capable of easy and rapid opening. No sign of any fermentative change could be discovered in them. The Quenelles de Volailles, also received, are primarily intended for use by invalids, or in yachting excursions or other similar trips where the finer luxuries of the table are unavailable. These quenelles are very savoury articles, only needing warming before service; while along with them, in an appetising sauce, some mushrooms are included. Owing to the fact that they are supplied in glass jars, not in metal, no trace of any flavour, sometimes imparted to foods preserved in tins, can be detected.

In addition to the jellies and the chicken quenelles, we tried Benoist's Consommé de Volailles. This Consommé is offered in glass jars similar to those containing the jellies, and when heated forms a clear "company" soup of excellent flavour, whose only fault, if it be a fault, is that it is much richer and with more body than such soups. This can easily be rectified by adequate dilution.

All the articles sent us were in admirable condition, of first-class flavour and form, and can be recommended without any hesitation as most suitable preparations for use by invalids, but also by those who do not possess a "company" cook, while desirous of giving a "company" dinner.

Now that the cost of carriage of small parcels is lessened through the parcel post, there is no longer any reason why first-class and absolutely trustworthy *plats* should not be obtainable at a cost below that incurred through the engagement of a highly-paid culinary artiste. Dishes from Benoist ought to be able to tickle the most fastidious palate.

Ovo.

(Mecredy Manufacturing Syndicate Limited.)

Ovo is, as its name indicates, a preparation made from eggs. In fact, it is a granular powder containing all the elements of the yolk and white of fresh eggs. The form which the yolk and white together take when dried differs somewhat from the familiar masses obtained by drying the white alone at a moderate temperature. It does not dissolve readily in cold water, but in warm water, below the coagulation point of egg proteid, forms a combined solution and emulsion. This mixture has a very faint acid reaction to litmus. If water above the coagulating point, or boiling, be used, no emulsion is formed; an evidence of the presence of unaltered albumin, and not of proteids combined with acid or alkali. The tardy solution of the albumin in cold water points to the same fact. Ovo is sold in small tins, each containing the desiccated equivalent of twelve eggs; with proper care and adherence to instructions, this may serve just as well as a dozen actual eggs, but if taken liberties with will afford the cook the hard task—similar to that of making bricks without straw—of switching hard-boiled eggs suspended in fragments in water. However, the instructions are not involved, and the advantages which can be derived from the fact of having a dozen eggs in a space properly occupied by two, without shells to break or contents to spill, must frequently prove to be of the utmost service to the caterers of many a household or party. Eggs can be completely dried under careful and scientific supervision at the ordinary temperature or a little above it, without any change in the composition of one of their components occurring. Ovo appears clearly to fulfil this condition.

OXYDOL (EAU MAICHE).

(Maiche Limited, London.)

OXYDOL is a well-known French speciality, consisting of a solution of peroxide of hydrogen, capable, it is stated, of affording three times its volume of available oxygen. It is a clear, colourless, odourless fluid, slightly acid to litmus paper. It effervesces gently on removing the cork from the bottle. The effervescence soon ceases. On adding a few drops of oxydol to a solution of permanganate of potassium, the dark red colour of the solution at once became of a brown tint, owing to its rapid reduction in the presence of peroxide of hydrogen, or of oxygen, or of both these bodies. As oxygen and peroxide of hydrogen are most active antiseptic agents outside the body, and act as digestive stimulants in the stomach, while possessing no poisonous properties, they might well be made more use of than they are at present or have been in the past. The more remote actions of peroxide of hydrogen are still uncertain. Actual trials have given very varied results as to its influence and its change in the body. However, this does not detract from the advantages afforded by oxydol, in all cases in which it may be wished to employ oxygen in treatment.

The liquor hydrogenii peroxidi of the present British pharmacopœia is of a somewhat similar composition, and reacts to tests in very much the same way. In oxydol we have a preparation containing the active agents ready made; a preparation of absolute purity, and one whose employment, in the treatment of cases where the curative effects of oxygen are called for, can be warmly recommended by us as meriting practical trial.

Izal Preparations.

(Newton, Chambers, & Co., Thorncliffe, near Sheffield.)

A number of Izal Preparations have been submitted to us by Messrs. Newton, Chambers, & Co. Izal itself is a strong antiseptic agent, capable of destroying the bacilli of diphtheria, enteric fever, cholera, etc., within five minutes, when used in a 0·5 per cent. solution, or 1 in 200. It is thus much more deadly to micro-organismal life than carbolic acid, while it is credited with non-poisonous properties towards human beings. In "Medical" Izal the substance is prepared with especial care and refinement, rendering it non-irritant, though strongly bactericidal. One tablespoonful made up to five pints with water yields a sufficiently active antiseptic solution for disinfectant purposes.

We have considerable personal knowledge of the action of Izal in cases of favus and ringworm, in which it may be employed in a stronger form, or even pure if applied to a limited area. In many cases the results were very satisfactory. For the treatment of wounds, chilblains, and such lesions, half an ounce in the pint acts well.

The source of Izal is to be found in coal, and it is separated during the process of turning the coal into coke in the form of an oil, whose chemical constitution forms an intermediate link between the phenols and methyl-alcohols. The oil is not soluble in water, but is prepared and sent out in the form of an emulsion containing 40 per cent. A very simple and inexpensive vaporiser is supplied by the manufacturers of Izal, along with a solution especially prepared for volatilisation. The vaporiser perhaps has one slight drawback. The tin cup intended for the reception of a night-light—the heating agent employed —is too shallow and too small in area to allow of the proper introduction of some water round the base of the light, both for the purpose of keeping the apparatus cool, and to ensure safety when unguarded for a length of time. In a short period the whole vaporiser becomes heated. The wax of the night-light may melt throughout, and although, as a rule, it may not escape from its case, it is just as well to provide against accident. A slightly deeper cup, with a narrower rim, which would allow of immersion of the light in a layer of cold water, would enhance the value of the vaporiser. Clark's light is the special form for which the vaporiser is adapted, and which is recommended by the makers. This light does not require to be placed in water, but it is as well to know that other night-lights ought not to be used with it unless placed in water.

As at present made, it doubtless causes a strong discharge of Izal vapour, but it would be safer if made in such a way that the heating of the lower part of the apparatus was lessened, even although its use in the present form has as yet been followed by nothing in the way of accident. The solution recommended to be used in the vaporiser, as yielding the most encouraging results, contains 10 drms. of pure terebene and 10 oz. Izal in 40 oz. of water.

Although Izal possesses so high an antiseptic activity, it does not coagulate proteids, affect the operator's hands, nor injure metallic instruments. It is also practically non-volatile. Bruce Clarke in the *Lancet*, Tunnicliffe in the *Pharmaceutical Journal*, and Klein and Delépine in special reports, have corroborated these statements.

Izal is also incorporated in a toilet soap, an overfatted soap of the first order; in a medical soap, similar to the last but with more Izal, for use before and after operations; and in a rough bar soap, strongly charged with Izal, for scouring purposes. As Izal oil presumably does not combine with or be rendered inert by the alkaline fatty bodies in soaps, as is the case with carbolic acid, it probably remains active, and does good, a service in which carbolic acid soaps cannot be ascribed any very great power.

Izal gauze and Izal wool are also supplied, with 1 per cent. of the oil (described as equal to 4 per cent. carbolic acid), while perles of Izal for internal administration are provided. Of the latter we have no personal knowledge, but they are well fitted for the purpose intended, and might probably serve as a useful means whereby an efficient, non-poisonous antiseptic agent can be introduced into the digestive tract. Of course the term "non-poisonous" is used in its relative sense; that is to say, that the moderate amounts necessary to produce efficient antisepsis are innocuous. Tunnicliffe gives 0·5 to 1·5 c.c. of pure Izal per kilo. of body weight as the measure of its toxicity, equal to about 3·5 oz. for an adult. But the ideal antiseptic, lethal to bacteria, while inert towards the living cells of animals, is still to seek; while the search for it is being made, Izal may afford many advantages over its rivals.

OBITUARY.

Hugh Cameron, F.R.S.G.S.

During a long series of years, not only while it was the property of Messrs. Oliver and Boyd, but previously, when it was in the hands of Messrs. Sutherland and Knox, the *Edinburgh Medical Journal* owed much to Mr. Hugh Cameron, whose death, at the age of 72, occurred on 10th November 1898. Mr. Cameron had been from early years associated with publishing, and was in this way brought into intimate relations with many different types of literary men. Full of heart, instinct with hopeful optimism, and possessing a large sympathy with every form of human knowledge, he was warmly esteemed by all who came in contact with him, and by none more than by those members of the medical profession associated with this Journal. Mr. Cameron was not merely sympathetic towards those who were engaged in scholarly and scientific work, but was also himself a contributor of articles, chiefly on historical subjects, all of which were marked by a literary taste and artistic faculty such as might be expected from one of his family. By his death an interesting and valuable link with the past has been severed, and many of us have lost a valued friend.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Five Weeks ending October 29, and for the Year from January 2.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 2.	Actual.	Accumulated from Jan. 2.	
		Above 42°.	Below 42°.					
Mean		[*1] 174°	31°	2·9	25·7	79	1185	2°·7
	46°·0	[2] 2228°	684°					
Observed		[1] 209°	1°	3·8	22·7	71	1241	2°·65
	49°·3	[2] 2426°	428°					
Difference		[1] +35°	−30°	+0·9	−3·0	−8	+56	−0°·05
	+3°·3	[2] +198°	−256°					

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland, during October, and since January 2. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Nervous System.		Respiratory System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896 . .	[1] 1,038	184·0	191	33·8	100	17·7	120	21·0	183	32·3
	[2] 10,711	189·5	2117	37·4	1010	17·8	1236	21·8	2007	35·5
Actual Deaths and Rate per 10,000	[1] 1,090	193·2	248	43·9	96	17·0	105	18·6	169	29·9
	[2] 10,990	194·5	2318	41·0	1071	18·9	1259	22·2	1834	32·4
Difference from Mean	[1] +52	+9·2	+57	+10·1	−4	−0·7	−15	−2·4	−14	−2·4
	[2] +279	+5·0	+201	+3·6	+61	+1·1	+23	+0·4	−173	−3·2

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1896 . .	[1] 81	14·3	28	5·0	66	11·8	96	17·0	49	8·7
	[2] 719	12·7	283	5·0	743	13·1	1058	18·7	474	8·39
Actual Deaths and Rate per 10,000	[1] 106	18·7	23	4·0	82	14·5	106	18·7	65	11·5
	[2] 885	15·6	259	4·6	851	15·0	1058	18·7	552	9·7
Difference from Mean	[1] +25	+4·4	−5	−1·0	+16	+2·7	+10	+1·7	+16	+2·8
	[2] +166	+2·9	−24	−0·4	108	+1·9	± 0	±0·0	+78	+1·31

[*] Note.—The figure [1] denotes the data for October, [2] for year to date.

The four weeks which ended on 29th October were marked by a continuance of the unusual warmth experienced throughout so many of the preceding months of the year. The excess of the mean temperature over the normal, 3°·3, was greater than even in September, and was most marked during the nights. The absence of cold weather was most exceptional, only 1 day-degree below 42° F. being recorded in place of, 31°; the absolute minimum for the East of Scotland being only 27°, the maximum noted 74°. The rainfall was heavier than usual, the sunshine smaller, the daily variability practically normal.

From the beginning of the year the accumulated day-degrees above 42° amount to 8·8 per cent. over, those below 42° to 37·4 below, the average number expected; the hours of bright sunshine 4·7 per cent. above the mean, the rainfall 11 per cent. below. The death-rate was above the average, especially from constitutional and digestive diseases, but also from pneumonia, phthisis, and cancer. Since 1st January 279 more deaths have occurred than expected, the excess occurring chiefly from constitutional and digestive disorders, pneumonia, and cancer. The excess under pneumonia now equals about 14 per cent.

Therefore October, characterised by a high temperature, absence of any cold weather, and excess of rain, but with a normal variability of temperature, shows an increased death-rate, especially from constitutional and digestive diseases, which also occasion the largest part of the year's increase.

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MEDICAL EDUCATION IN THE UNITED KINGDOM.

I. Education in General.

Before describing the requirements imposed upon all those who desire to obtain a degree or diploma with the right to practise medicine and surgery, a word may well be said about the important questions—Which degree or diploma to work for? and which teaching institution to attend? There are three courses open to the aspirant to medical honours. He may enter a university which affords education as well as confers degrees; he may study at certain medical schools, and take his degree at a university which does not possess a teaching staff; or he may enter for one of the licences to practise granted by certain medical bodies. A university degree has certainly greater credit associated with it, but now that a minimum course of study, lasting for at least five years, and including a large number of compulsory classes, has been made obligatory upon all graduates and licentiates alike, the difference between the instruction provided by the universities and by the different medical schools is not so great as formerly.

As a rule, the total cost incurred during the period of study for a college diploma is not so high as that for a university degree. The charges, however, vary greatly in the different schools and universities, nor can the minimum cost of a curriculum at any of them be accurately estimated. The usual sum for the class and degree fees spread over the five years is about £150 to £160, when necessary extras are included.

The table on the following page gives approximately the minimum cost of obtaining the different degrees and diplomas.

The exact expense incurred during the period of professional training for these degrees and diplomas varies according to the school attended.

The fees at the different London hospitals can be compounded for by one or two payments, the sum of which is less than the total if paid by annual instalments. The curriculum for the London Colleges' diplomas costs from £110 to £158, exclusive of the examination fees. If the London University M.B. course is taken, the cost is somewhat greater. The degrees of the Scottish Universities cost, with the examination fees, from £115 to £145; the licence of the Scottish Colleges, from £115 to £130.

TABLE I.—*The Approximate Cost of the Minimum Curriculum for Degrees and Diplomas of the Universities and Medical Schools.*

1. TEACHING UNIVERSITIES.				
	Diplomas.	Class Fees.	Examination Fees, etc.	Total.
Edinburgh	M.B., Ch.B.	£115 0	£28 7	£143 7
Glasgow	M.B., Ch.B.	97 13	28 7	126 0
Aberdeen	M.B., Ch.B.	90 0	23 2	113 2
Dublin	B.A., M.B., B.Ch., B.A.O.	207 12	27 0	234 12
Durham	M.B.	115 0	26 0	141 0
,,	M.B., B.S.	115 0	31 0	146 0
Victoria University	M.B., Ch.B.	138 6	17 0	155 6
Oxford	B.A., B.M., B.Ch.	165 0	30 0	£165–£220
Cambridge	M.B., B.C.	150 0	20 0	£150–£200
2. NON-TEACHING UNIVERSITIES.				
London	M.B., B.S.	£150 0	£17 0	£167 0
Royal, Ireland	M.B., B.Ch., B.A.O.	145 0	17 0	162 0
3. LICENSING BODIES.				
Conjoint Scottish Qualification	L.R.C.P.E., L.R.C.S.E., and L.F.P.S.Glasg.	£90 0	£30 0	£120 0
Conjoint English Qualification	L.R.C.P. Lond., and M.R.C.S. Eng.	£90–£120	36 15	£126–£156
Society of Apothecaries	L.S.A.	£90 0	15 0	£105 0
Conjoint Irish Qualification	L.R.C.P.I., and L.R.C.S.I.	135 0	42 0	172 0
Apothecaries' Hall	L.A.H.	90 0	22 1	112 1

At the provincial medical schools in England the college expenses for the London Colleges' diploma are—Mason College, Birmingham, £133; Owens College, Manchester, £115, 3s.; about the same sum at University College, Sheffield; £123 at University College, Bristol; £115, 10s. at the Yorkshire College, Leeds; £125 at the University College, Liverpool.

For the London University degree, £25 will, as a rule, require to be added to these figures, to cover the fees for classes necessary for the Preliminary Scientific Examination.

In Ireland, the Dublin University only confers the M.B., B.Ch., B.A.O. degree on Bachelors of Arts; the cost therefore is

considerably higher than elsewhere. The expense incurred while
working for the Irish diplomas comes to about £140 in Dublin,
[illegible] of the Queen's Colleges,
[illegible] Galway. The degree of the Royal [illegible]
[illegible] £65 at the Catholic University [illegible]
[illegible] the diploma of the conjoint colleges,
[illegible] examinations, therefore, [illegible]
[illegible] and, adding the cost of books, in[illegible]
[illegible] for the five years, say £30, and of [illegible]
[illegible] each year, £300, we ge[illegible]
[illegible] with the curriculum, of from [illegible]
[illegible] is the utmost minimum; in mo[illegible]
[illegible] it, will be spent in the five years.

[illegible] OF THE GENERAL MEDICAL COUNCI[illegible] [illegible] ENTERING UPON THE FIVE YEARS' [illegible] [illegible] CONSTITUTING THE MINIMU[illegible] [illegible] GRADUATION OR LICENCE.

[illegible] Examination and Registration.

[illegible] registered as a medical student, fr[illegible]
[illegible] his five years' course is calculated,
[illegible] examination in the subjects of gene[illegible]
[illegible] recognised by the General Medica[illegible]
[illegible] Table [illegible], pp. iv.–vii.)
[illegible] certificate is only accepte[illegible]
[illegible] registration, provided that it cert[illegible]
[illegible] have been passed at one and [illegible]

[illegible] enters his name on the books of a [illegible] the necessary classes, and paid the necessary fees, but that he has given satisfaction to his teachers by his conduct, and taken part in the class examinations held during the sessions. The minimum attendance on classes which constitutes an *annus medicus* is fixed at two courses of lectures during each session, or one course of lectures and hospital practice.

Graduates in Arts or Science of any university recognised by the Medical Council, who shall have spent a year in the study of physics, chemistry, and biology, and have passed an examination in these subjects for the degrees in question, shall be held to have completed the first of the five years' of medical study.

TABLE II.—*List of Examining Bodies whose Examinations in General Education are recognised by the Medical Council as qualifying for Registration as Medical or Dental Student.*

Testimonials of proficiency granted by educational bodies, according to the subjoined list, will be accepted by the Council, which reserves the right to add to or take from the list.

A Degree in Arts of any university of the United Kingdom, or of the colonies, or of such other universities as may be specially recognised from time to time by the Medical Council, is considered a sufficient testimonial of proficiency.

I. UNIVERSITIES IN THE UNITED KINGDOM.

Universities of Oxford, Cambridge, and Durham:—

(1) Junior Local Examinations (certificate to include all the required subjects at one time).
(2) Senior Local Examinations (certificates to include the required subjects).
(3) Responsions (certificate to be supplemented by others showing that the required mathematical subjects have been passed). Oxford.
(4) Moderations (certificates to include the required subjects). Oxford.
(5) Final Examination for a Degree in Arts.
(6) Higher Local Examinations (certificates to include the required subjects). Cambridge.
(7) Previous Examination (certificates to include the required subjects). Cambridge.
(8) General Examination (certificates to include the required subjects). Cambridge.
(9) Examination for Certificate of Proficiency (certificate to include all the required subjects at one time). Durham.
(10) Preliminary Examination in Arts for Graduation in Medicine and Science (certificate to include the required subjects). Durham.

Universities of London and Wales, and Victoria University:—

(11) Matriculation Examination (certificate to include the required subjects). London.
(12) Final Examination for a Degree in Arts or Science.
(13) Preliminary Examination (certificate to include all the required subjects at one time). Victoria.
(14) Entrance Examination in Arts (certificate to include all the required subjects at one time). Victoria.
(15) Matriculation Examination (certificate to include all the required subjects at one time). Wales.

Universities of Edinburgh, Aberdeen, Glasgow, and St. Andrews:—

(16) Junior Local Examination (certificate to include all the required subjects at one time). Edinburgh and Aberdeen.
(17) Senior Local Examination (certificates to include the required subjects). Edinburgh and Aberdeen.
(18) Preliminary Examination for Graduation in Medicine and Surgery (certificate to include the required subjects).
(19) Preliminary Examination for Graduation in Arts or Science (certificate to include the required subjects).
(20) Final Examination for a Degree in Arts or Science.
(21) Final Examination for the Diploma of L.L.A. St. Andrews.

University of Dublin:—

(22) Public Entrance Examination (certificate to include the required subjects).
(23) Examination for the First, Second, Third, or Fourth Year in Arts (certificate to be signed in the approved form by the medical registrar of the university).
(24) Final Examination for a Degree in Arts.

Royal University of Ireland:—

(25) Matriculation Examination (certificate to include the required subjects).
(26) Final Examination for a Degree in Arts or Science.

Oxford and Cambridge Schools' Examination Board:—

(27) Lower Certificate (to include all the required subjects at one time).
(28) Higher Certificate (certificates to include the required subjects).

II. MEDICAL LICENSING BODIES.

Royal Colleges of Physicians and Surgeons in Ireland:—

(29) Preliminary Examination (certificate to include all the required subjects at one time).

III. EDUCATIONAL BODIES OTHER THAN UNIVERSITIES.

College of Preceptors:—

(30) Examination for a First-Class Certificate or Second-Class Certificate of First or Second Division (to include all the required subjects at one time).

(31) Preliminary Examination for Medical Students (certificate to include all the required subjects at one time).

Scotch Education Department:—
(32) Examination for Lower Grade Leaving Certificate (to include all the required subjects at one time).
(33) Examinations for Higher Grade or Honours Leaving Certificate (to include the required subjects).

Educational Institute of Scotland:—
(34) Preliminary Medical Examination (certificate to include all the required subjects at one time).

Intermediate Educational Board of Ireland:—
(35) Junior or Middle Grade Examination (certificate to include all the required subjects at one time).
(36) Senior Grade Examination (certificates to include the required subjects).

IV. INDIAN, COLONIAL, AND FOREIGN UNIVERSITIES AND COLLEGES.

Universities of Calcutta, Punjab, Allahabad, and Sydney:—
(37) Entrance Examination.

Universities of Bombay; Madras; M'Gill College and Bishop's College, Montreal; Fredericton, New Brunswick; Toronto; Trinity and Victoria, Toronto; Queen's, Kingston; Western, Ontario; Mount Allison College, New Brunswick; King's College, Nova Scotia; Dalhousie, Halifax; Melbourne; Sydney; and Cape of Good Hope; and the Colleges of Quebec; Trinity, Toronto; Ontario; and New Brunswick:—
(38) Matriculation Examination.

Ceylon Medical College; Universities of Manitoba, Otago, and New Zealand; and the Medical Boards of Nova Scotia and Newfoundland:—
(39) Preliminary Examination.

Universities of Madras and Sydney:—
(40) First Examination in Arts.

Universities of Sydney, Adelaide, and Tasmania:—
(41) Senior Public Examination.

Codrington College, Barbadoes:—
(42) Arts Examinations at Durham University.

Continental Bodies:—
(43) The German Abiturienten-Examen of the Gymnasia and Realgymnasia; Examinations entitling to the French Diplomas of Bachelier ès Lettres and Bachelier ès Sciences, and other corresponding Entrance Examinations to the Universities.

Egyptian Government:—
(44) Secondary Education Certificate.

(*a*) No certificate from the bodies in the foregoing section (IV.) is accepted unless it shows that the examination has been conducted by or under the authority of the body granting it, includes all the subjects required by the General Medical Council, and states that all the subjects of examination have been passed in at one time; and copies of the form of the required certificate are supplied by the registrar of the Council for the purpose.

(*b*) In the case of natives of India or other Oriental countries whose vernacular is other than English, an examination in a classic Oriental language may be accepted instead of an examination in Latin.

The Subjects in which Courses are required of all Candidates by the General Medical Council.

In every course of professional study and examinations, the following subjects must be contained:—

(1) Physics, including the elementary mechanics of solids and fluids, and the rudiments of heat, light, and electricity.

(2) Chemistry, including the principles of the science, and the details which bear on the study of medicine.

(3) Elementary biology.
(4) Anatomy.
(5) Physiology.
(6) Materia medica and pharmacy.
(7) Pathology.
(8) Therapeutics.
(9) Medicine, including medical anatomy and clinical medicine.
(10) Surgery, including surgical anatomy and clinical surgery.
(11) Midwifery, including diseases peculiar to women and to new-born children.
(12) Theory and practice of vaccination.
(13) Forensic medicine.
(14) Hygiene.
(15) Mental disease.

It is to be understood, as regards the above-mentioned subjects, that the Council offers no opinion as to the manner in which the subjects should be combined or distributed for purposes of teaching or examination.

TABLE III.—*Details of the Curriculum required by the various*

(Minimum Age in all, 21 years ;

	SUBJECTS OF COURSES REQUIRED,																
	Length of Compulsory Study at Institution giving Degree.	Chemistry.	Practical Chemistry.	Botany.	Zoology.	Physics.	Practical Physics.	Anatomy.	Practical Anatomy.	Physiology.	Practical Physiology.	Practical Histology.	Materia Medica and Therapeutics.	Practical Pharmacy.	Pathology.	Practical Pathology.	Post-mortems.
SCOTLAND.	Years																
M.B., Ch.B. niversities of Edinburgh, Glasgow, Aberdeen, St. Andrews	2	6	3	3	3	3	..	6	12	6	3	..	6	25 mtgs. or 3 mths.	6	3	3 mths. 20 sect. 25 sect. Course
.R.C.P. and L.R.C.S.Ed.; and L.F.P.S.Glasg.; and the Scotch Colleges . .	.	6	3	..	3	3	..	6	12	6	..	..	3	3	3	..	3
ENGLAND.																	
London University, M.B. . " " B.S. .	..	C.	C.	..	C.	C.	..	6	12	6	..	..	C.	C.	C.	..	C.
Durham University, M.B. . " " B.S. .	1	6	3	..	3	3	3	12	12	6	3	3	3	3	3	..	25 (sect.
Victoria University, M.B. . " " B.S. .	2	6	3	..	4	6	3	6	15	6	C.	..	9	C.	6	C.	12
Universities of Oxford[1] M.B., Cambridge B.C.	6 3	C.	C.	..	C.	Course		C.	6	6	..	..	C.	C.	C.	..	C.
L.R.C.P.Lond.; and M.R.C.S. Eng., London Colleges .	..	C.	C.	..	C.	6	..	6	12	C.	6		3	3	3		12
L.S.A. London, Society of Apothecaries . . .	..	6	3	..	3	..	..	6	12	6	3	..	6	3	3	..	C.
IRELAND.																	
Dublin University, B.A. M.B., B.Ch., B.A.O. . . .	4	6	3	3	3	C.	..	6	12	12	..	3	3	..	6	3	3
Royal University, Dublin, M.B., B.Ch., B.A.O. . .	..	6	3	3	3	3		12	12	12	3	..	3	3	3	3	6 (sect.
L.R.C.P.I. and L.R.C.S.I., Irish Colleges . . .	..	6	3	..	3	3	..	6	12	6	..	3	3	3 or 3 yrs. apprentice.	..	..	30 mtgs

Figures represent months unless

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[1] The Oxford degrees are only conferred on those holding the B.A. degree of the University; the details of the

Universities and Licensing Bodies for Degrees or Diplomas.

ength of Course, 5 years.)

with Length of Attendance.

and Public Health.	Medicine.	Clinical Medicine.	Surgery.	Clinical Surgery.	Operative Surgery.	Regional Anatomy.	Midwifery and Diseases of Women.	Diseases of Women.	Labour Cases, or Practical Midwifery.	Hospital Practice.	Dispensary.	Mental Diseases.	Infectious diseases.	Ophthalmology.	Diseases of Children, or Laryngology.	Clerk and Dresser in Hospital. Med.	Clerk and Dresser in Hospital. Surg	Vaccination.
										Years		Meetings.				Med.	Surg	
3	6	9	6	9	C.	..	6	..	12 cases or 3 mths. and 6 cases	3	6	16 16 ·C. C.	12 10 3 mths. C.	24 20 3 mths. C.	18 (optional) 3 mths.	6	6	Certificate.
3	6	0	6	9	..	..	3	..	20 cases or 3 mths. and 6 cases	2	6	13	13	13	..	Cer ca	tifi- te.	
												Mths.	Months.	Months.				
urse.	6	24	6	24	.. C.	.. ..	C.	..	20 cases	4	6	2	2	..	..	..	..	
C.	12	18	12	18	.. C.	.. C.	3	..	20 "	4	..	3	20 cases	..	..	6	6	
3	12	24	6	24	.. 6	.. ..	6	3	20 "	2	..	C.	C.	..	..	6	6	
C.	6	C.	6	C.	C.	..	C.	..	20 "	3	..	C.	3	..	..	6	6	
3	6	9	6	9	C.	..	3	12 mtgs.	20 "	2	6	C.	C.	3	..	6	6	
3	6	9	6	9	3	..	6	..	20 "	3	..	3	3	3		6	6	
										Mths.								
..	6	27	6	27	3	6	6	..	6 mths. 30 cases	27	..	3	C.	3	..	..	..	1
3	6	33	6	33	24 mtgs.	..	6	..	6 mths. 20 cases	33	..	3	10 cases and 3 mths.	3	..	3	3	10 mtgs.
..	6	27	6	27	30 mtgs.	..	6	..	6 mths. 30 cases	27	..	3	C.	3		..	..	Certificate.

therwise stated. C. = Course.

urriculum required differ in many respects from the others. and may be obtained from the University Authorities.

TABLE IV.—*Table of* [illegible]

					Summer.
ENGLAND AND W[illegible]					
London University			..	..	..
The Royal College of Physicians, London, and Surgeons, England	March	June Preceptors.)	..	..	..
London Hospitals: Guy's			Oct. 3.	..	May 2.
St. Bartholomew's			" 3.		" 1.
St. Mary's			" 3.	..	" 1.
Westminster			" 3.		" 1.
London	As in last two.		" 3.		" 2.
Middlesex			" 3.		" 2.
St. George's			[illegible]		[illegible]
Charing Cross			" 3.		" 1.
St. Thomas's			" 3.		" 1.
King's			" 3.		[illegible]
University			" 3.		[illegible]
[illegible]					
[illegible]	Sept. 13, Jan. 3, March 14.		" 1.	..	1.
Victoria University: Owens College, Manchester	June and September.		" 1.		1.
[illegible]			" 3.	..	1.
Yorkshire College, Leeds			" 3.	..	1.
Mason's College, Birmingham	March.		" 1.		" 1.
University College, Bristol	June and September.		..	..	
Sheffield School of Medicine	" "		" 3.	..	
Universities of Wales: University College, Bangor	Local Examinations by College of Preceptors, etc.		" 1.	..	
" " Cardiff			" 3.	..	
" " Aberystwyth	..		..	..	
SCOTLAND.					
Universities of Edinburgh	Oct. 1-8.	April 1-8.	Oct. 18.	..	April 25.
Glasgow			" 20.	..	
Aberdeen			" 19.	..	
St. Andrews			" 11.	..	
Edinburgh School of Medicine	Sept. 20, April 6, July 6.		" 18.	..	[illegible]
University College, Dundee			[illegible]	..	
St. Mungo's College, Glasgow			[illegible]		
Anderson's College, Glasgow			" 30.		
IRELAND.					
Dublin University					
Royal University of Ireland					
Conjoint Colleges					
[illegible]					
[illegible]		..	" [illegible]	..	

C. SINGLE QUALIFICATIONS NOT CONFERRING IN THEMSELVES THE RIGHT TO REGISTER.

any of the colleges confer degrees or diplomas on members e profession who already possess a registrable qualification. M.B. of London and Durham Universities allows the holder actise, while the examination for M.B. at Oxford and idge is the same as that for B.C.

ving to the limited space at our disposal, it is impossible to nto any details as to the conditions under which these degrees plomas are given, especially as they appertain to graduates ardly require information about them. All the universities degrees of Doctor of Medicine and Master in Surgery on graduates, only imposing as a condition that a longer or r interval shall elapse between graduation and the grant of gher degree. Generally, the candidate has to present an l essay or thesis, and in some instances to pass a clinical nation.

Cambridge University the M.D. degree may be taken three after M.B., B.C. two years after M.C. The London and m M.D. and M.S. are conferred on M.B. and B.S. graduates tively after two years have elapsed; the equivalent degrees Victoria University, after one year. At the Scotch Univer- the degrees of M.D. or Ch.M. are granted after two years' e or one year's hospital or research work, if the candidate be rs old. Both the Irish Universities require three years to e.

Royal Colleges.

e Royal College of Physicians of London grants the ership to university graduates or to its licentiates after an ination fee £42. Recipients must have attained the age of [illegible] the Royal College of Surgeons, who must be 25 years of age, and registered practitioners of two years' standing. Fee for licentiates, £30; for others, £45. Similar regulations apply to the Fellowship of the Faculty of Physicians and Surgeons of Glasgow, but 24 is the minimum age. The fees are different, if the candidate desires to qualify for holding office or not; £50 or £30 for non-licentiates, £15 or £25 for licentiates.

The Royal College of Physicians of Ireland grants licences in medicine and in midwifery to registered practitioners, a membership diploma to licentiates 25 years of age, of three years' standing, and to practitioners of seven years' standing or University B.A.s., after one year's possession of the licence. Fee, £21 (£15, 15s. to graduates in Arts).

The Royal College of Surgeons in Ireland retains the right of deciding whether candidates for the Fellowship shall be admitted to examination or not. Licentiates or graduates in surgery of less than ten years' standing have to pass two examinations; fees, £26, 5s. for licentiates of the college, £42 for others. When of more than two years' standing they have only one examination; fees, £26, 5s. and £42, as before.

Further information with regard to these qualifications can be obtained from the secretaries of the different colleges. A list containing their names and addresses will be found below (p. xxii.).

POST-GRADUATE COURSES.

In London, Edinburgh, Dublin, Cambridge, regular post-graduate classes are now held, although, when compared with the classes for graduates carried on in connection with many of the continental medical schools, they still leave much to be desired, both in arrangement and in the zeal shown by those who might be expected to support them more warmly. At most of the infirmaries and hospitals throughout the kingdom, in which clinical teaching is recognised, graduates can attend either on the same terms as undergraduates or at special rates.

In London practical courses are given throughout the year, exclusively for graduates, particulars of which can be obtained from Dr. Fletcher Little, 32 Harley Street, W. At present the lectures are delivered in connection with the following hospitals and institutions:—The Hospital for Diseases of the Skin, Blackfriars; Bethlem Royal Hospital for Lunatics; the London Throat Hospital, Great Portland Street; the Bacteriological Laboratory, King's College; the Central London Sick Asylum, Cleveland Street; the Parkes Museum; and the Institute of Preventive Medicine, 101 Great Russell Street, W.C.

At Charing Cross Hospital special series of clinical lectures and practical demonstrations, exclusively arranged for the convenience of practitioners and post-graduate students, are given by members of the staff throughout the year. The lectures for the year are arranged in three courses, each consisting of ten meetings, and lasting ten weeks.

In Cambridge, graduates of other universities are admitted as advanced students. They may for one or more terms pursue courses of advanced study or research, literary or scientific, under the direction of the university teachers, and may become members of certain colleges without fulfilling the same conditions as are imposed on junior students, their collegiate status being assimilated to that of students who have taken their first degree in the university.

In Edinburgh various post-graduate courses are carried on throughout the year, and arrangements have again been made for series of courses in the under-mentioned subjects, to commence simultaneously on or about September 27th:—

Anatomy (medical and surgical); bacteriology; central nervous system (anatomy and pathology of); dermatology; demonstrations of modern gastric methods; diseases of the chest, children, ear, throat and nose; electricity in medicine; gynecology; infectious diseases; ophthalmology; ophthalmoscopy; pathology; practical sanitation; surgery, clinical, practical and operative, and minor surgery in children.

On application to the Honorary Secretary, Post-Graduate Courses, Surgeons' Hall, a fuller syllabus will be forwarded.

THE MEDICAL EDUCATION OF WOMEN.

A number of qualifications are now open to men and women alike. The degrees of the London and Durham Universities in England, of the Royal University of Ireland, and of the four Scotch Universities, may be conferred on women; who also may be granted the conjoint diplomas of the Scotch and Irish Boards, and the licence of the Society of Apothecaries, London.

The conditions for the qualification of women are practically the same as those for men. The University of Edinburgh, however, does not recognise attendance on mixed classes without sufficient reason shown.

The secretaries of the different schools, from whom prospectuses and any information required may be obtained, are as follows:—

London School of Medicine for Women—Miss Douie, 30 Handel Street, Brunswick Square, W.C.
Newcastle School of Medicine (Durham University)—Secretary, Durham University.
Medical College for Women, Minto House, Edinburgh—Miss H. F. Mackay.
Queen Margaret's College, Glasgow—Miss Galloway.

Royal College of Surgeons, Ireland (rooms in connection with the college are set apart for the use of female students)—I. F. Blake, Registrar.

The tables given below show the different degrees and diplomas open to women, the recognised schools, and the approximate cost of the class and college fees.

Table V.—*Degrees and Diplomas open to Women.*

University Degrees.	Diplomas.
London. Durham. The Royal, Ireland. The Four Scotch Universities.	1. *Conferring Qualification to Practise.* The Triple Qualification of the Royal Colleges, Scotland. The Conjoint Qualification of the Royal Colleges, Ireland. The Society of Apothecaries, London. 2. *Not conferring Qualification.* Licence of the Royal College of Surgeons, Edinburgh.

With the exception of two of the Scottish Universities, all these qualifications are given on the same conditions as to men. At Edinburgh and Glasgow Universities the compulsory two years' residence is allowed to be represented by residence at a recognised School for the Medical Teaching of Women.

Table VI.—*Medical Schools for Women.*

Name.	Cost of Curriculum and Fees.
London School of Medicine for Women, Brunswick Square	£125
College of Medicine, Newcastle-on-Tyne .	£146
Scottish Association, Edinburgh (qualifies for Edinburgh University)	(University), £128, 7s. (Colleges), £130
Queen Margaret College, Glasgow (qualifies for Glasgow University)	£129
Schools of Surgery of the Royal College of Surgeons, Ireland	(For College Degree), £165–£172.
Aberdeen and St. Andrews Universities (only first two years at St. Andrews).	
Dundee University College (only for first two years).	

PUBLIC HEALTH.

The Local Government Act, passed in 1888, provides that all medical officers of health of counties or districts with a population of 50,000 or more, must possess a diploma in public health, or must have been a medical officer of a district with 20,000 inhabitants for three consecutive years before 1892; or, before the passing of the aforesaid Act, have been for not less than three years a medical officer or inspector under the Local Government Board.

Qualifications in public health (sanitary science, sanitary medicine, State medicine) are therefore much more sought after than formerly. They do not carry a right to register, and are only conferred on candidates already possessed of a registrable qualification.

Certain regulations for candidates for diplomas in public health, designed to ensure "the possession of a distinctly high proficiency, scientific and practical, in all the branches of study which concern the public health," have been laid down by the General Medical Council. The Council now expects the following rules to be observed:—

Every candidate shall produce evidence of having, after obtaining a registrable qualification, attended during six months, practical instruction in a laboratory.

1. A period of not less than twelve months shall elapse between the attainment of a registrable qualification in medicine, surgery, and midwifery, and the admission of the candidate to any examination or any part thereof for a diploma in sanitary science, public health, or State medicine.

2. Every candidate shall produce evidence of having, after obtaining a registrable qualification, attended during six months, practical instruction in a laboratory or laboratories, British or foreign, approved of by the body granting the diploma, in which chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man are taught.

3. Every candidate shall produce evidence that, during a period of six months after obtaining a registrable qualification, he has practically studied the duties of outdoor sanitary work—(*a*) In England and Wales, either under the medical officer of health of a county or of a single sanitary district having, at the date of the last census, a population of not less than 50,000, or the medical officer of health of a combination of two or more sanitary districts having collectively at the date of the last census a population of not less than 35,000; or (*b*) in Scotland or Ireland, under the medical officer of health of a county, or of one or more sanitary districts having at the date of the last census a population of not less than 30,000; or (*c*) under a medical officer of health who is a teacher in the department of public health of a recognised medical school. The certificate of an assistant officer of health of a county or a large urban district may be accepted, provided the medical officer of health of the county or district consents to the assistant officer giving such instruction.

⁂ Any candidate who shall produce evidence that he has himself held an appointment of medical officer of health, under conditions not requiring the possession of a special sanitary diploma, shall be exempt from this regulation.

4. Every candidate shall produce evidence that he has attended

the clinical practice of a hospital for infectious diseases, recognised by one of the licensing bodies; provided that such a course of instruction may have been taken as part of the curriculum for his registrable qualification in medicine, surgery, and midwifery.

5. The examination shall be conducted by examiners specially qualified; it must extend over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health.

⁂ The rules as to study shall not apply to medical practitioners registered, or entitled to be registered, on or before 1st January 1890.

Degrees and Diplomas.

DEGREES (FOR UNIVERSITY GRADUATES IN MEDICINE).

M.D. (State Medicine), London. (Two years' study required.)

B.Hy., Durham. (Three months' course in comparative pathology (lectures), must study at Newcastle School of Medicine.)

B.Sc., Edinburgh. (Eight months' laboratory (five at Edinburgh University), courses in physics, geology, public health, sanitary engineering, and in mensuration and drawing required, as well as official regulations.)

D.Hy., Durham. (Earliest date, two years after B.Hy., spent as M.O.H. Essay sent in.)

D.Sc., Edinburgh. (Five years after B.Sc., Thesis and Examination.)

DIPLOMAS.

D.P.H.
- Durham University. (Regulations as for B.Hy., but need not be a University graduate, nor have studied at Newcastle.)
- Oxford University. (Must fulfil General Medical Council's conditions.)
- Cambridge University. (Do., age 24 or over.)
- Victoria University. (As at Oxford.)
- Aberdeen University. (Fever hospital course, six months; if not M.B.Aberd., must attend some of the necessary classes.)
- Royal Colleges, London. (As at Cambridge.)
- Royal Colleges, Edinburgh and Glasgow. (As at Oxford.)

D.S.M., Dublin University. (Must be a graduate of the Universities of Dublin, Oxford, or Cambridge, or M.D.)

,, Royal Colleges, Ireland. (As at Oxford.)

D.S.Sc., Royal University, Ireland. (Only conferred on graduates of the University. Cf. p. 167 of Calendar.)

Medical practitioners who registered or were entitled to register before 1st January 1890 are admitted to the examination for the Durham D.P.H., under the same conditions as are noted above. Twenty-eight days' notice is required. Fee, £10, 10s. At Oxford and Cambridge Universities the diplomas in public health are granted to any registered person who, if he qualified before 1st January 1890, is not required to pursue a prescribed course of study. Similar regulations govern the examinations of the different colleges in the case of those who qualified prior to 1890.

The actual scope of the examinations as held at the different centres can be easily ascertained from the syllabuses and calendars to be obtained from the secretaries. The titles of the books best adapted for perusal in view of the examinations may be seen in the *British Medical Journal* for 27th August 1898, p. 560.

Age necessary. London, M.D. (State Med.), 23 years; Cambridge and London Colleges, 24 years; others, 22 years.

Fees for examinations—£10, 10s.; Colleges in London, Scotland, and Ireland, D.P.H., Durham and Victoria, £5, 5s.; Aberdeen, £5; London University and Royal Ireland, £6, 6s.; Edinburgh, £12, 12s.; Cambridge, £16, 10s. B.Hy., Durham, D.Sc., Edinburgh, £10, 10s. additional.

Usual fee for six months laboratory work, £10, 10s. to £21.

Institutions at which Laboratory Work and Classes for Public Health Curriculum can be taken.

LONDON.

St. Bartholomew's Hospital.—Inclusive fee, 20 guineas.

Charing Cross Hospital.—Inclusive fee, 20 guineas.

St. George's Hospital.—Inclusive fee, 20 guineas; for candidates registered before 1st January 1890, 12 guineas.

Guy's Hospital.—Inclusive fee for six months' course of laboratory instruction and lectures, 20 guineas.

King's College.

London Hospital.—Inclusive fee, 20 guineas; three months' course, 12 guineas.

St. Mary's Hospital.—Six months' course, inclusive fee, 12 guineas.

St. Thomas's Hospital.—Inclusive fee, 20 guineas; short course, 6 guineas.

University College.

PROVINCIAL.

Cambridge University.
Mason College, Birmingham.
University College, Liverpool.
Yorkshire College, Leeds.
University of Durham College of Medicine, Newcastle-on-Tyne.
University College, Bristol.

IRELAND.

School of Physic, Dublin.
The Catholic University School of Medicine.
Royal College of Surgeons, Schools of Surgery, Dublin.

SCOTLAND.

University of Edinburgh.—Fees, winter session, 10 guineas; summer session, 6 guineas.

University of Glasgow.—Fee for course of instruction, 10 guineas.

University of Aberdeen.

St. Mungo's College, Glasgow.—Fees: winter session of lectures and six months' laboratory instruction, 12 guineas; summer session of lectures and three months' laboratory instruction, 6 guineas.

The Conjoint Board in Scotland.

CLINICAL HOSPITALS.

There are a number of hospitals throughout the kingdom which may be attended for the purpose of clinical study, especially during the fifth year of the curriculum, and attendance at which is accepted by many of the licensing boards as part of the compulsory period for hospital work.

In *London*, in addition to the clinical hospitals attached to the medical schools, the conjoint board of the Royal Colleges of Physicians and Surgeons accept certificates of attendance during the fifth year of study, from the—Great Northern Central Hospital, 155 beds; West London Hospital, 175 beds, Fee, 5 guineas; The Hospital for Sick Children, Great Ormond Street, 186 beds, Fee, 3 guineas; East London Hospital for Children, 100 beds, Fee, 4 guineas; Royal London Ophthalmic Hospital, 100 beds, Fee, 5 guineas; Hospital for Consumption, Brompton, 321 beds, Fee, 8 guineas; City of London Hospital for Diseases of the Chest, 164 beds; National Hospital for the Paralysed, etc., Queen Square, 200 beds; Queen Charlotte's Lying-in Hospital, 1100 patients annually, Fee, 8 guineas for four weeks.

Fever hospitals and asylums.—The Metropolitan Fever Hospitals, Fee, £3, 3s., two months, £1, 1s. each additional month; Bethlem Royal Hospital, Lower Hall Asylum, Bow; Camberwell House Asylum, Bethnal.

THE PROVINCES.

Liverpool—Royal Southern, 200 beds, Fee, £26, 5s.[1]; Northern, 155 beds, Fee, £26, 5s.[1]; Eye and Ear Infirmary, Myrtle Street, 46 beds; Infirmary for Children, 88 beds, free.

Manchester—St. Mary's Hospital for Diseases of Women and Children, 55 beds, 3400 labours, Fee for necessary course, £2, 2s.

Newcastle-on-Tyne—Hospital for Sick Children, 60 beds, free.

Bath—Royal United Hospital, 130 beds.

Birmingham—Midland Hospital for Skin and Urinary Diseases, £5, 5s. for three months.

Bradford—Royal Infirmary, 230 beds, £10, 10s.[1]

Brighton—Sussex County Hospital, 190 beds, £21 for two years.

Derby—Derbyshire Royal Infirmary, 198 beds, £10, 10s. annually.

Devonport—Royal Albert Hospital, 88 beds, £2, 2s.

Hospitals in *Exeter*, *Gloucester*, £20 a year; *Lincoln*, £10, 10s.; *Norwich*, £15, 15s.; *Nottingham*, £10, 10s.; *Staffordshire*, £10, 10s.; *Winchester*, £21;[1] *Wolverhampton*, £21.[1]

SCOTLAND.

Edinburgh—Royal Infirmary, 790 beds, £12[1]; Victoria Hospital for Consumption, £2, 2s. for course; Royal Hospital for Sick Children, 96 beds, £2, 2s. for course; Eye, Ear, and Throat Infirmary, £1, 1s.; Royal Maternity, £2, 2s.; City Hospital for Infectious Diseases, £2, 2s.; Royal Asylum, Morningside, 700 beds, £2, 2s.

Glasgow—Royal Hospital for Sick Children, 80 beds, £1, 1s.; Western Infirmary, 400 beds, £21[1]; Eye Infirmary, £1, 1s.; Royal Infirmary, £21[1]; Maternity; Belvidere Fever Hospital; Lock Hospital.

Dundee—Royal Infirmary, 286 beds; Royal Asylum.

Aberdeen—Royal Infirmary, Fee, £6; Sick Children's Hospital.

IRELAND.

Dublin—Sir Patrick Dun's Hospital, £12, 12s;[1] Richmond, Whitworth, and Hardwicke Hospitals,[2] 312 beds; Richmond Asylum, 1200 beds; Adelaide Hospitals, 140 beds; City of Dublin Hospital; Jervis Street Hospital, £12, 12s. a year; Mater Misericordiæ Hospital,[2] 323 beds; Dr. Steeven's Hospital,[2] 200 beds, £10, 10s., three months; St. Vincent's Hospital, 160 beds; Meath Hospital,[2] 160 beds; Rotunda Hospital, 1700 labours intern, 1800 extern annually—Fee, for term, six months, £21, three months, £12, 12s, Extras, £10, 10s. and £6, 6s.; Cork Street Fever Hospital; Coombe Lying-in Hospital.

Belfast—The Royal, £20;[1] Maternity; Ophthalmic; Eye, Ear, and Throat Hospitals; and those for Diseases of Women, for Sick Children, and the District Asylum.

Cork—North (100 beds) and South (100 beds) Infirmaries; the Mercy, Cork Union, Lying-in, Maternity, Fever, Gynecological, and Ophthalmic and Aural Hospitals; and the Eglinton Asylum.

Galway—County Infirmary and Lower Hospital.

DENTAL SURGERY.

Licences to practise dentistry and to be registered are obtainable from the Royal College of Surgeons of England, of Edinburgh, and of Ireland, and from the Faculty of Physicians and Surgeons of Glasgow.

A large number of the medical teaching institutions provide special arrangements for dental students. A list of the majority of these is given on page xxii.

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[1] Perpetual.

[2] Contain beds for Fever patients.

Regulations of the General Medical Council.

Candidates for a diploma in dental surgery shall produce certificates of having been engaged during four years in professional studies, and of having received three years' instruction in mechanical dentistry from a registered practitioner. One year's *bonâ fide* apprenticeship with a registered dental practitioner, after being registered as a dental student, may be counted one of the four years of professional study. The three years of instruction in mechanical dentistry, or any part of them, may be taken by the dental student, either before or after his registration as a student; but no year of such mechanical instruction shall be counted as one of the four years of professional study unless taken after registration.

A register of dental students is kept by the Registrar of the General Medical Council, 299 Oxford Street, London.

Preliminary education.—Dental students are subject to the same regulations as regards preliminary education as medical students, but professional study may commence by pupilage with a registered dental practitioner.

The Royal College of Surgeons of England.

Licence in Dental Surgery.

The following are the regulations :—

I. There is a Preliminary Science Examination and two Professional Examinations for the licence. The Preliminary Science Examination consists of chemistry, physics, and practical chemistry, and is identical with Part I. of the First Examination of the Examining Board in England. The First Professional Examination for the licence consists of mechanical dentistry and dental metallurgy; and the Second, general anatomy and physiology, general surgery and pathology, dental anatomy and physiology, dental pathology and surgery, and practical dental surgery. Candidates will be required to show a general knowledge of the anatomy of the whole human body.

II. Candidates will be required to produce certificates of having received instruction, at an institution recognised for the purpose, in chemistry, physics, and practical chemistry, before entering for the Preliminary Science Examination.

⁂ This instruction may be taken prior to the date of registration as a dental student.

III. Candidates will be required to produce the following certificates before entering for the First Professional Examination, namely :—

1. Of having been engaged, during a period of not less than three years, in acquiring a practical familiarity with the details of mechanical dentistry, under the instruction of a competent practitioner, or under the direction of the superintendent of the mechanical department of a recognised dental hospital, where the arrangements for teaching mechanical dentistry are satisfactory to the Board of Examiners in Dental Surgery. In the case of qualified surgeons, evidence of a period of not less than two instead of three years of such instruction will be sufficient.

⁂ This instruction may be taken prior to the date of registration as a dental student.

2. Of registration as a dental student by the General Medical Council.

3. Of having attended at a recognised dental hospital and school:

(*a*) A course of lectures on dental metallurgy.

(*b*) A course of practical dental metallurgy.

(*c*) A course of lectures on dental mechanics.

(*d*) A course of practical dental mechanics, including the manufacture and adjustment of six dentures and six crowns.

IV. Candidates will be required to produce the following certificates before entering for the Second Professional Examination, namely:—

1. Of having been engaged during four years in the acquirement of professional knowledge, subsequently to the date of registration as a dental student.

2. Of having attended at a recognised dental hospital and school:

(*a*) A course of dental anatomy and physiology.

(*b*) A separate course of dental histology, including the preparation of microscopical sections.

(*c*) A course of dental surgery.

(*d*) A separate course of practical dental surgery.

(*e*) A course of not less than five lectures on the surgery of the mouth.*

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* These lectures may be given either at a recognised dental hospital and school, in which case the lecturer must be a qualified surgeon practising surgery, or they may be given at a recognised medical school, and may form part of the course required by Section IV., Clause 4 (*d*).

3. Of having attended at a recognised dental hospital or in the dental department of a recognised general hospital, the practice of dental surgery during two years.

4. Of having attended at a recognised medical school:

(*a*) A course of lectures on anatomy.

(*b*) A course of lectures on physiology.

(*c*) A separate practical course of physiology.

(*d*) A course of lectures on surgery.

(*e*) A course of lectures on medicine.

5. Of having performed dissections at a recognised medical school during not less than twelve months.

6. Of having attended at a recognised hospital or hospitals, the practice of surgery and clinical lectures on surgery during two winter sessions.

7. Of being 21 years of age.

⁂ The certificates of professional study will be required to show that students have attended the courses of professional study to the satisfaction of their teachers.

V. Candidates may present themselves for the Preliminary Science Examination before entering at a dental school, on production of the certificates required under Section II. This examination will be identical with Part I. of the First Examination of the Examining Board in England.

VI. Candidates may present themselves for the First Professional Examination for the licence after the completion of six months' attendance at a recognised dental hospital and school, on production of the certificates required under Section III.

VII. Candidates may present themselves for the Second Professional Examination, on production of the certificates required under Section IV., after the completion of four years' professional study from the date of registration as a dental student, and after the lapse of not less than six months from the date of passing the First Professional Examination.

VIII. Synopses of the examination in chemistry, physics, and practical chemistry, and dental metallurgy, are issued with the regulations.

IX. The Preliminary Science Examination will be held in January, March or April, July and October in each year.

The First and Second Professional Examinations will be held in May and November in each year. Candidates are required to give twenty-one clear days' notice of their intention to present themselves for examination.

Special Exemptions.

A candidate who shall produce satisfactory evidence of having passed an examination for a degree in medicine, conducted at a university in the United Kingdom, in India, or in a British colony, on the subjects of the Preliminary Science Examination, will be exempt from that examination.

Candidates who have passed the Second Examination of the Examining Board in England, or who shall produce evidence of having passed the examination in anatomy and physiology required for the licence in surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an examination in anatomy and physiology required for a degree in medicine or surgery at a university in the United Kingdom, will be exempt from re-examination in those subjects.

Candidates who are members of the college, or who have passed the examination in surgery of the Examining Board in England, or who shall produce evidence of having passed the examination in surgery for the licence in surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an examination in surgery for a degree in medicine or surgery at a university in the United Kingdom, will be exempt from re-examination in general surgery and pathology.

Fees to be paid by candidates, £21.

THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

Licence in Dental Surgery.

The candidate must fulfil the conditions of the regulations of the General Medical Council (see above); and the regulations as to curriculum are generally the same as those of the Royal College of Surgeons of England.

Special Exceptions.

Candidates who have passed the corresponding examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the Final Dental Examination or to the Final Examination for the Triple

Qualification, or to both. But the First Dental Examination will not be held as equivalent to the Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are licentiates of this college, or who may be registered medical practitioners, will require to produce certificates of attendance on the special subjects only, and will be examined in these only for the dental diploma. Any candidates who shall produce satisfactory evidence of having passed in any of the subjects of the First Dental Examination, before any dental or surgical licensing board recognised by the Royal College of Surgeons of Edinburgh, will be exempt from examination in such subject or subjects; but no examination will be recognised as giving exemption, unless it is coextensive in its scope with the examinations of this college, and is the only final examination on the subject or subjects required by the board at which it was passed.

Fees.—The fee for the diploma is £10, 10s. to those who began their studies before 1st October 1896; £15, 15s. to those who began after that date.

Faculty of Physicians and Surgeons of Glasgow.

The regulations as to certificates, curriculum, number of examinations, fees, and examinations are in effect similar to those of the Royal College of Surgeons of Edinburgh. There is special provision for candidates who intend to qualify both under the Medical and Dentists Act, and there is an examination in practical dentistry conducted in a dental hospital, and also a practical examination in mechanical dentistry.

The Royal College of Surgeons in Ireland.

Licence in Dentistry.

Candidates are required to pass three examinations, namely, Preliminary (in general education), Primary Dental, and Final Dental.

DENTAL TEACHING INSTITUTIONS.

London.

Dental Hospital of London and School of Dental Surgery, Leicester Square. Fee for dental course of two years, £50. Fee for general and hospital practice for two years, £55.

National Dental Hospital or College, Great Portland Street, W. Fee for necessary course, £42.

Guy's Hospital and London Hospital.

Provinces.

Mason's College, Birmingham. Composition fee, £73, 2s.

Liverpool Dental Hospital (University College). Composition fee, £73, 2s.

Bristol General Hospital.

Durham University and Newcastle School of Medicine.

University College, Bristol.

Owens College, Manchester.

Devon and Exeter Dental Hospital, Exeter.

Scotland.

Incorporated Edinburgh Dental Hospital and School. Minimum fee, £78, 13s.

Dental Hospital and School, Glasgow.

Dental Department, Royal Glasgow Infirmary.

Anderson's College, Glasgow.

Ireland.

School of the Royal College of Surgeons, Ireland.

Special composition fees are charged at several of the London hospitals for the classes required by dental students apart from those taken at a dental hospital. Thus, Charing Cross and Middlesex Hospitals, £56, 14s.; Westminster Hospital, £50; St. Thomas's, £65; St. George's, £50; King's College, hospital fee, two years, £25, 4s.; lectures, £15, 15s.

NAMES AND ADDRESSES OF THE SECRETARIES AND REGISTRARS OF CERTAIN OF THE MEDICAL SCHOOLS.

I. *Branch Registrars of the General Medical Council.*

England—Mr. H. E. Allen, B.A., LL.B., 299 Oxford Street, London, W.

Scotland—Mr. James Robertson, 48 George Square, Edinburgh.

Ireland—Mr. S. Wesley Wilson, 35 Dawson Street, Dublin.

II. *Secretaries and Registrars, etc., of Medical Bodies.*

The Secretary—Examining Board in England, Victoria Embankment, London, W.C.

The Secretary—Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.

The Secretary—Apothecaries' Hall, Blackfriars, London, E.C.

The Secretary—University of Durham, College of Medicine, Newcastle-on-Tyne.

The Secretary—Royal College of Physicians, Edinburgh.

The Secretary—School of Medicine of the Royal Colleges, Edinburgh, 24 Forrest Road, Edinburgh.

The Secretary—Royal College of Surgeons, Edinburgh.

The Secretary—Anderson's College Medical School, Glasgow; Professor A. M. Buchanan, M.A., M.D.

The Secretary—Educational Institute of Scotland, 40 Princes Street, Edinburgh.

The Secretary—Royal University of Ireland, Dublin.

The Registrar—Royal College of Physicians, Pall Mall East, London, S.W.

The Registrar—University of London, Burlington Gardens, London, W.

The Registrar—Mason's College, Birmingham.

The Dean of the Faculty of Medicine—In each of the Scotch Universities.

The Dean of the Faculty of Medicine—Victoria University, Owens College, Manchester.

III. *Inspectors of Conjoint Examination in Scotland.*

Mr. James Robertson, 48 George Square, Edinburgh.

Mr. Alexander Duncan, B.A., Faculty Hall, 242 St. Vincent Street, Glasgow.

ARMY MEDICAL DEPARTMENT.

WAR OFFICE, LONDON.

Schedule of Qualifications necessary for Candidates desirous of obtaining Commissions in the Army Medical Staff, with the Conditions of Service.

QUALIFICATIONS.

1. A candidate for a commission in the Army Medical Staff must be 21 years and not over 28 years of age at the date of commencement of the competitive examination. He will be required to produce the following documents:—

(*a*) An extract from the register of his birth; or, if this is not obtainable, a declaration made before a magistrate by one of his parents or guardians, giving the date of his birth.

(*b*) A recommendation from a person of standing in society (not a member of his own family) to the effect that he is of regular and steady habits, and likely in *every* respect to prove creditable to the department, if a commission be granted.

(*c*) A certificate of moral character from the clergyman of the parish in which the candidate resides, if possible.

2. He must possess two diplomas or licences, recognised by the General Medical Council,—one to practise medicine and the other surgery, and must be registered under the Medical Act in force in the United Kingdom at the time of his appointment; but a candidate who holds a single diploma from the Society of Apothecaries, obtained under the conditions of the Medical Act of 1886, will be deemed to possess the double qualification required.

A candidate must also produce:—

(*a*) A certificate of having discharged the duties of a medical clinical clerk during six months, and of a surgical dresser during another six months, of which, in each case, not less than three months must have been spent in the wards of a hospital.

(*b*) A certificate of having attended a course of instruction during not less than three months at an ophthalmic hospital, or the ophthalmic department of a general hospital, which course shall include instruction in the errors of refraction.

3. The candidate must sign a declaration upon honour that he is of pure European descent, and that he labours under no mental or constitutional disease, no hereditary or personal tendency thereto, nor any imperfection or disability that can interfere with

the efficient discharge of the duties of a medical officer in any climate ; also that he does not hold, and has never held, any commission or appointment in the public services.

4. His physical fitness will be determined by a board of medical officers, who are required to certify that his vision is sufficiently good to enable him to pass the tests laid down by regulations. The board must also certify that he is free from organic or other disease, and from constitutional weakness, or other disability of any kind likely to unfit him for military service in any climate.

Certificates of age, registration of diplomas, etc., and of character, must accompany the declaration when signed and returned.

5. A public and open competition will be held twice in the year for the admission of qualified candidates as probationers. The number of appointments so competed for will be not less than half of the number of vacancies which shall have arisen in the last completed half-year ending on the 30th June or 31st December. It will be competent for the Secretary of State for War to fill up the remaining number from such qualified candidates as may be proposed by the governing bodies of public schools of medicine in the United Kingdom, or in the Colonies, as he may think proper. Every candidate so proposed must be approved by the Director-General of the Army Medical Department, and be certified by the governing body proposing him to be duly qualified, according to a standard laid down by the Secretary of State.

The Secretary of State reserves the right of rejecting any candidate who may show a deficiency in his general education, as evinced by bad spelling or composition.

An entrance fee of £1 is required from each candidate admitted to the competition, and is payable at the conclusion of his physical examination, if pronounced fit.

6. The Secretary of State for War will from time to time fix the order of precedence and the proportion in which the several schools of medicine shall be offered the nomination of candidates.

7. A surgeon on probation will be required to pass through such course at the Army Medical School as the Secretary of State shall decide, and after passing a qualifying examination in the military medical subjects taught there, and satisfying the Director-General that he possesses the necessary skill, knowledge, and character for permanent appointment to the Army Medical Staff, he will be commissioned as surgeon-lieutenant.

The surgeons on probation who pass out of the Army Medical School at one qualifying examination will take precedence among each other as surgeon - lieutenants, as follows :—(*a*) Those appointed on nomination, according to their date of joining on probation ; (*b*) those appointed by competition, according to the last day of the competitive examination, and in order of merit, as determined by the combined results of the competitive and qualifying examinations, with priority over any joining under paragraph (*a*) on the last day of the competitive examination. Their commissions will bear the date of the day of their passing out of the Army Medical School.

EXAMINATIONS.

Compulsory Subjects for the Entrance Examination.

1. Candidates will be examined by the Examining Board in the following compulsory subjects, and the highest number of marks attainable will be distributed as follows:—(*a*) Surgery, 1200; (*b*) medicine, including therapeutics and diseases of women and children, 1200; (*c*) anatomy and physiology, 600; (*d*) chemistry and pharmacy, and a practical knowledge of drugs, 600. No candidate shall be considered eligible for the medical staff who shall not have obtained at least *one-third* of the marks obtainable in each of the above *compulsory subjects,* and at least *one-half* of the aggregate of marks for all the compulsory subjects.

Voluntary Subjects for the Entrance Examination.

2. Candidates may be examined in the following voluntary subjects, for which the maximum number of marks obtainable will be:—Modern languages—French, German, and Hindustani, 200 marks each. Natural sciences—A candidate may not present himself for examination in more than two of the following subjects:—(*a*) Physics, 300; (*b*) zoology, 300; (*c*) geology and physical geography, 300; (*d*) botany, 300. A number less than one-third of the marks obtainable in each of these *voluntary subjects* will not be allowed to count in favour of the candidate who has qualified in the *compulsory subjects.* The knowledge of modern languages being considered of great importance, all intending competitors are urged to qualify in French and German.

The appointments announced for competition will be filled up from the list of qualified candidates, arranged in the order of merit, as finally determined by the total number of marks each has obtained in both the compulsory and voluntary subjects.

After passing this examination, every successful candidate will be required to attend one course of practical instruction at the Army Medical School as a surgeon on probation in—(1) Hygiene; (2) clinical and military medicine; (3) clinical and military surgery; (4) pathology of diseases and injuries incident to military service.

All surgeons on probation will be required to conform to such rules of discipline as the senate may from time to time enact, and provide themselves with uniform, namely, the regulation undress and mess uniform of a surgeon-lieutenant, including the serge jacket, but without the sword, sword-belt, dress trousers, and badge of rank.

They will be required to attend the Army Medical Staff mess at Netley, and to conform to the rules and regulations thereof.

Extracts from the Royal Warrant for Pay and Promotion, 1894, *as amended by Royal Warrant of* 18*th Sept.* 1894, *and from the Regulations for Army Medical Services*, 1894.

PAY.

The pay of the officers of our Army Medical Staff shall be at the following rates:—

		Exclusive of Allowances.		
Director-general of the Army Medical Department, at headquarters	(yearly)	£1500	0	0[1]
Surgeon-major-general	(daily)	2	15	0
At headquarters	(yearly)	1300	0	0[1]
Surgeon-colonel	(daily)	2	0	0
At headquarters	(yearly)	900	0	0[1]
Brigade-surgeon-lieutenant-colonel	(daily)	1	10	0
After 5 years in the rank	„	1	13	0
At headquarters	(yearly)	750	0	0[1]
Surgeon-lieutenant-colonel:—				
After 20 years' service	(daily)	1	5	0
„ 25 „	„	1	7	6
At headquarters	(yearly)	650	0	0[1]
Surgeon-major or surgeon-lieutenant-colonel	(daily)	1	0	0
After 15 years' service	„	1	2	6
At headquarters	(yearly)	650	0	0[1]
Surgeon-captain or surgeon-lieutenant	„	200	0	0
Surgeon-captain	„	200	0	0
After 5 years' service	„	250	0	0
„ 10 „	(daily)	0	15	0
Surgeon on probation	„	0	8	0

Quartermaster (daily) as a quartermaster of infantry (Arts. 187 and 191).

RETIRED PAY.

An officer of our Medical Staff, after completing ten years' service on full pay, may be permitted to retire from our army with retired pay or gratuity, according to the scale laid down in Art. 1071, if such voluntary retirement be specially recommended by our Commander-in-Chief, and approved by our Secretary of State.

The appointment of Director-General of the Army Medical Department shall be for seven years, and the retirement of the other officers of our Army Medical Staff shall be compulsory at the following ages, except that if it should in any particular case be considered desirable in the interests of the public service, the age for the retirement of a surgeon-major-general may be extended for a period not exceeding two years—surgeon-major-general and surgeon-colonel, 60 years; brigade-surgeon-lieutenant-colonel, surgeon-lieutenant-colonel, surgeon-major, surgeon-captain, and surgeon-lieutenant, 55 years.

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[1] Inclusive of allowances.

RATES.

Director-general, Army Medical Department:—	Yearly.		
After 7 years' service as director-general, and not less than 30 years' service in the department	£1125	0	0
After 5 years' service as director-general, and not less than 30 years' service in the department	1000	0	0
Under 5 years' service as director-general, if retiring on account of ill-health, and after not less than 30 years' service in the department	875	0	0
After 3 years' service as director-general, but with less than 30 years' service in the department, in addition to the retired pay of a surgeon-major-general	100	0	0
Surgeon-major-general, on retirement under Art. 347, 457, or 458, or with 3 years' service as such,[1]	Daily.		
if retiring voluntarily	£2	0	0
Surgeon-colonel, on retirement under Art. 347, 457, or 458, or with 3 years' service as such,[1] if retiring voluntarily	1	15	0
Brigade-surgeon-lieutenant-colonel, on retirement under Art. 347, 457, or 458, or with 3 years' service as such,[1] if retiring voluntarily:—			
Under 30 years' service	1	7	6
After 30 ,, ...	1	10	0
Surgeon-lieutenant-colonel:—			
After 20 years' service	1	0	0
,, 25 ,, ...	1	2	6
,, 30 ,, ...	1	5	0
Surgeon-major:—			
After 20 years' service	1	0	0
Surgeon-lieutenant-colonel, surgeon-major, surgeon-captain, or surgeon-lieutenant:—	Gratuity.		
After 10 years' service	£1250	0	0
,, 15 ,, ...	1800	0	0
,, 18 ,, ...	2500	0	0

An officer of our Army Medical Staff who, on voluntary retirement, has served for less than three years in the rank from which he retires, shall be only entitled to the gratuity or retired pay assigned to the next lower rank.[1]

PROMOTION.

A surgeon-lieutenant shall, if he be recommended by the Director-General, be promoted to the rank of surgeon-captain on completing three years' full-pay service.

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[1] The requirement of three years' service in the rank only applies, in the case of the medical staff, to officers promoted since the date of the warrant of August 26, 1889.

A surgeon-captain shall, if he be recommended by the Director-General, be promoted to the rank of surgeon-major on completing twelve years' full-pay service, including at least three years abroad.

A surgeon-major shall, if he be recommended by the Director-General, be promoted to the rank of surgeon-lieutenant-colonel, on completing twenty years' full-pay service.

A brigade-surgeon-lieutenant-colonel shall be selected, on the recommendation of our Commander-in-Chief, for ability and merit, from surgeon-lieutenant-colonels who have served abroad for at least eight years.

All promotions from the rank of brigade-surgeon-lieutenant-colonel to that of surgeon-colonel, and from the rank of surgeon-colonel to that of surgeon-major-general, shall be given for ability and merit, upon the selection of our Commander-in-Chief, with the approval of our Secretary of State; and the grounds of such selection shall be stated to us in writing. In all such cases the amount of service abroad shall be expressly stated.

On appointment as honorary physician or honorary surgeon to Her Majesty, under Article 345, an officer below the rank of surgeon-colonel shall, if duly qualified under Article 343, be promoted to that rank, and shall remain supernumerary of his rank until he would have attained the rank of surgeon-colonel in ordinary course.

An officer shall not be eligible for promotion to the rank of surgeon-colonel unless he has served at least ten years abroad, including three years in India.

Regulations for the Examination of Surgeon-Captains before Promotion to Surgeon-Major (Regulations for Army Medical Service, Appendix I.)

1. This examination is intended to test the progress and proficiency of a surgeon in all those branches of knowledge which are essential to his continued efficiency as a medical officer, and may be taken at any time after his seventh year of service.

The examination in medicine and surgery will be held by two gentlemen appointed by the Secretary of State; that in hygiene by the Professor of Hygiene, Army Medical School, Netley; and that in regulations, duties, military law, etc., by an administrative medical officer, nominated for the purpose by the Director-General.

2. The examination will embrace the following subjects:—(*a*) Surgery and surgical anatomy. (*b*) Medicine and pathology. (*c*) Hygiene, within the limits treated of in Parkes' "Practical Hygiene"; also the regulations regarding the sanitation of garrisons, quarters, hospitals, etc., as well as of camps and hospitals in the field, and of transports, troop, and hospital ships. (*d*) Duties of medical officers at home, abroad, and at sea, as defined in regulations; also hospital organisation and administration in peace and war, in-

cluding the transport of sick and wounded by land and sea. (*c*) The administration, interior economy, command, and discipline of the Medical Staff Corps, together with a knowledge of the principles of military law and their practical application (a certificate of proficiency in military law obtained at a garrison class will exempt the holder from examination in the latter).

3. A certificate will be required from a recognised teacher of surgery in any medical school, at home or abroad, in which operative surgery is taught, showing that the medical officer has gone satisfactorily through a complete course of operative surgery during the period within which the examination must be taken, and that he is a competent operator.

4. A report on any subject of a practical professional character, to be selected by the officer himself, and certified to be his own composition and in his own handwriting, will also be required. Considerable importance will be attached to the literary and scientific merits of this report, which must be furnished before the officer completes twelve years' service.

5. The examinations will be conducted by printed questions, which will enter so far into the subject-matter of each head selected for examination as to show that the officer's knowledge has been fully tested.

6. The questions and answers will be forwarded, under a sealed confidential cover, to the Director-General of the Army Medical Department, for transmission to the examiners, who will report to the Director-General as to the competence of the officer examined.

INDIAN MEDICAL SERVICE.

The regulations for the examination of candidates for admission to Her Majesty's Indian Medical Service differ only slightly from those of the home service. The declarations are sent to the Military Secretary, India Office, Westminster.

The physical fitness of each candidate will be determined previous to examination by a board of medical officers, who are required to certify that his vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses. Further particulars as to the standard of eyesight will be found in a pamphlet by Sir J. Fayrer, M.D., K.C.S.I., entitled "Regulations as to Defects of Vision," published by Messrs. J. & A. Churchill, 7 Great Marlborough Street, W. A moderate degree of myopia will not be considered a disqualification, provided it does not necessitate the use of glasses during the performance of operations, and that no organic disease of the eyes exists. Every candidate must also be free from all other organic disease, and from constitutional weakness, or other disability likely to unfit him for military service in India. Candidates who pass the Medical Board Examination will be required to pay a fee of £1 before being permitted to compete.

Hindustani is included among the voluntary subjects, and candidates presenting themselves for examination in it are recommended to study some recognised text-book, such as the annotated edition of the "Taubut-un-Nasuk," which is the text used by candidates for the Indian Civil Service.

Course at Netley.—These courses will be of not less than four months' duration; but candidates who have already gone through a course at Netley, as candidates for the Army Medical Service, may, if thought desirable, be exempted from attending the School a second time.

At the conclusion of the course at Netley, and after the leaving examination, the position of the candidates on the lists of surgeon-lieutenants will be determined by the combined results of the Preliminary and Final Examinations, and, so far as the requirements of the service will permit, they will have the choice of commands in India (*i.e.* Bengal, Punjab, Madras, or Bombay) according to their position in that list.

Officers appointed to the Indian Medical Service will be placed on one list. Though ordinarily employed within the limits of the command to which they may have been posted, they will be liable to employment in any part of India, according to the exigencies of the service.

No candidate will be permitted to compete more than three times.

Examinations for admission to the service usually take place twice in the year, *i.e.* in February and August.

The examiners in London will prepare a list in order of merit, with the marks affixed in the different subjects, to be transmitted to the Director-General and communicated to the professors of the Army Medical School. If any candidate is found to be deficient in any particular subject, this shall be stated, in order that he may receive special instruction on the point at Netley.

Pay and Allowance.

The following are the rates of "Indian pay and allowances" which will be drawn by officers hereafter appointed to the Indian Medical Service:—

Rank.	Years' Service.	Indian Pay and Allowances per mensem. When not holding an appointment carrying higher pay.		
		R.	A.	P.
Brigade-surgeon-lieutenant-colonel	25 and over	900	0	0
Surgeon-lieutenant-colonel	,,	888	12	0
Surgeon-lieutenant-colonel	20 ,,	852	3	7
Surgeon-major	15 ,,	677	6	11
,,	12 ,,	640	14	6

Rank.	Years' Service.	*A.* When not receiving any Staff Allowance. R. A. P.	*B.* When receiving Staff Allowance in addition. R. A. P.
Surgeon-captain . .	10 and over	500 0 0	450 0 0
,, ,, . .	5 ,,	450 0 0	400 0 0
Surgeon-captain and surgeon-lieutenant	under 5	350 0 0	300 0 0

On first appointment they will only come into receipt of "Indian pay and allowances" (Column *A*) from the date of their arrival in India.

Officers holding the principal administrative appointments and substantive military charges of the Indian Medical Service receive at present the following consolidated salaries:—

	Rs. per mensem.	
Surgeon-major-general, Bengal . . .	2700	
,, Madras . . .	2500	
,, Bombay . . .	2200	
Surgeon-colonel from . . .	1800	
to . . .	2250	
Brigade-surgeon-lieutenant-colonel of twenty years service and upwards	1100	with Rs. 90 horse allowance in cavalry regiments.
Surgeon-lieutenant-colonel, in substantive charge of a native regiment	1000	with Rs. 90 do.
Surgeon-major under twenty years' service in substantive charge of a native regiment .	800	with Rs. 90 do.
Surgeon-captain above five years' full pay service in substantive charge of a native regiment .	600	with Rs. 60 do.
Surgeon-captain or surgeon-lieutenant under five years' do. in substantive charge of a native regiment	450	with Rs. 60 do.

The salaries of other substantive medical appointments in the civil and military departments are consolidated, and vary from Rs. 1800 to Rs. 400 per mensem.

Leave Rules.

Officers of the Indian Medical Service, below the rank of surgeon-colonel, may be granted—(1) Privilege leave, under such regulations as may from time to time be in force; (2) leave out of India, for no longer period than one year, capable of extension to two years' absence from duty, on the following pay:—

After arrival in India, on first appointment	£200 a year.
After the commencement of the 5th year's service for pension . .	250 ,,
Do. do. 10th do. . .	300 ,,
Do. do. 15th do. . .	400 ,,
Do. do 20th do. . .	450 ,,
Do. do 25th do. . .	500 ,,

(3) Leave in India, but for the period of one year only, on full military pay and half the staff salary of appointment.

Retiring Pensions and Half-Pay.

Officers of the Indian Medical Service will be allowed to retire on the following scale of pension, on completion of the required periods of service :—

After 30 years' service for pension	£700	per annum.
,, 25 ,, ,,	500	,,
,, 20 ,, ,,	365	,,
,, 17 ,, ,,	292	,,

Officers not entitled to pension, when placed on temporary or permanent half-pay, will be granted the British rate of half-pay of their military rank as under :—

Rank.	Rates of Half-pay.				
	Per diem.		Per annum.		
	s.	d.	£	s.	d.
Brigade-surgeon-lieutenant-colonel Surgeon-lieutenant-colonel	11	0	200	15	0
Surgeon-major	9	6	173	7	6
Surgeon-captain	7	0	127	15	0
Surgeon-lieutenant	3	0	54	15	0

Officers cannot retire *in India* on half-pay (No. 45, 28th February 1865).

NAVY MEDICAL DEPARTMENT.

The regulations for this service correspond very closely to those for the army, with the following exceptions :—

The candidate must also declare his readiness to engage for general service at home or abroad as required.

The official requirements in the natural sciences are as follows :—

Zoology.—The examination in zoology will include the general principles of biology and a comparison of animals with plants; the distinctive characters of the larger group of animals—the protozoa, cœlenterata, vermes, arthropoda, mollusca, echinodermata, and vertebrata—as illustrated by common types; the elements of embryology; animal parasites.

Botany.—The general principles of the morphology and physiology of low forms of life, for example, torula, bacteria, spirogyra, moss, fern; the general morphology of flowering plants; diagnosis of the important British natural orders; medicinal plants.

Physics.—The general principles of mathematics, acoustics, optics, heat, magnetism, and electricity, as: the properties of solids, liquids, and gases; conservation of energy, specific gravity, propagation and reflection of sound and light, temperature, specific and latent heat, thermometers, properties of mirrors and lenses, chromatic dispersion of light, forms of batteries, galvanic and frictional electricity, general properties of magnets.

Physical geography.—The relation of the earth to the rest of the solar system, nature of the earth's crust; the chief kinds of rocks, general configuration of land and water, mountains, plains, lakes, rivers, islands, glaciers and icebergs, the ocean currents, tides, the earth's atmosphere, winds and storms, dew, rain, climate, volcanoes, earthquakes, general distribution of animal and vegetable life.

Successful candidates, immediately after passing the examination, will receive commissions as surgeons in the Royal Navy, and will undergo a course of practical instruction in naval hygiene, etc., at Haslar Hospital.

PAY AND RANK.

Rank.	Daily.			Yearly.		
	£	s.	d.	£	s.	d.
Surgeon—on entry	0	11	6	209	17	6
,, after 4 years' full-pay service	0	13	6	246	7	6
,, ,, 8 ,, ,,	0	15	6	282	17	6
Staff-surgeon—on promotion	1	1	0	383	5	0
,, after 4 years' full-pay service in rank	1	4	0	438	0	0
Fleet-surgeon—on promotion	1	7	0	492	15	0
,, after 4 years' full-pay service in rank	1	10	0	547	10	0
,, ,, 8 ,, ,,	1	13	0	602	5	0
Deputy inspector-general	2	2	0	766	10	0
Inspector-general	2	15	0	1,003	15	0

On first appointment to the service, medical officers will receive full pay from date of appointment, but subject to the provisions of Art. 1342, Clause 2, of the Queen's Regulations, 1893.

The allowance of 5s. a day, in addition to full pay, at present granted to the fleet-surgeon of a flag ship, bearing the flag of a commander-in-chief on a foreign station, will be given to the senior medical officer, being a fleet- or staff-surgeon, and an allowance of 2s. 6d. a day to the senior medical officer, being a fleet- or staff-surgeon, of the ship of a commodore, or of a senior officer commanding a foreign station.

Medical officers conducting the course of instruction at Haslar Hospital will receive the following allowances:—

The senior officer employed upon this duty	£150 a year.
The junior officer assisting	50 a year.

The hospital allowances for naval medical officers at home and abroad, in lieu of provisions for themselves and servants, and for fuel and light, are as follow:—

	At Home.	Abroad.
Inspectors-general of hospitals	£85	£130
Deputy inspectors-general	67	112
Fleet-surgeons and staff-surgeons	53	112
Surgeons	39	108

Medical officers serving afloat receive an allowance of 1s. 6d. a day in lieu of provisions, fuel and lights, as laid down in the Queen's Regulations. The travelling allowances, extra pay, lodging money, and compensation for losses, are fixed for naval medical officers according to their relative rank in the service.

HALF-PAY.

The undermentioned scale of half-pay is substituted for that hitherto in force:—

Rank.	Daily.			Yearly.		
	£	s.	d.	£	s.	d.
Surgeon—under 2 years' full-pay service	0	6	0	109	10	0
,, after 2 years' full-pay service	0	7	0	127	15	0
,, ,, 4 ,, ,,	0	8	0	146	0	0
,, ,, 6 ,, ,,	0	9	0	164	5	0
,, ,, 8 ,, ,,	0	10	0	182	10	0
,, ,, 10 ,, ,,	0	11	0	200	15	0
Staff-surgeon—on promotion	0	12	0	219	0	0
,, after 2 years' full-pay service in rank	0	13	0	237	5	0
,, ,, 4 ,, ,,	0	14	0	255	10	0
,, ,, 6 ,, ,,	0	15	0	273	15	0
Fleet-surgeon—on promotion	0	17	0	310	5	0
,, after 2 years' full-pay service in rank	0	18	0	328	10	0
,, ,, 4 ,, ,,	0	19	0	346	15	0
,, ,, 6 ,, ,,	1	0	0	365	0	0
Deputy inspector-general—on promotion	1	5	0	456	5	0
,, after 2 years' full-pay service in rank	1	7	0	492	15	0
,, ,, 4 ,, ,,	1	9	0	529	5	0
Inspector-general	1	18	0	693	10	0

PRISON MEDICAL SERVICE.

This branch presents limited opportunities, either for entrance, or for subsequent advancement. The smaller prisons are officered, as a rule, by local practitioners. The medical officers to the larger prisons are appointed by the Convict Prison Board, or the Prison Commission. Special forms may be obtained from the secretary of the latter at the Home Office, on which applications are to be made. In the Convict Service there are eight posts, with salaries ranging from £250 to £550; in the Local Prison Service twenty-eight officers, with salaries from £250 to £500.

COLONIAL SERVICES.

Applicants for posts under the Colonial Office must be between the ages of 23 and 30, be doubly qualified, and preferably have held hospital appointments. The usual certificates require to be shown, and an official medical examination undergone. Applications for posts or for information are to be sent to the assistant-secretary, Colonial Office. As a rule, about twelve to fifteen vacancies occur annually. In addition to these, a number of semi-official appointments are made yearly by this office, in connection with public works, etc., in the Colonies.

PRACTITIONERS ABROAD.

In the majority of the British Colonies local registration of legal British qualification suffices to allow a practitioner to pursue the duties of his profession. Only in two (cf. Table VII.)

is this unnecessary; while in one, Ontario, a local diploma must be gained after examination.

Few of the foreign nations allow British registered practitioners to practise, unless they first pass the State examinations. Table VII. gives a tabular view of the different regulations current:—

TABLE VII. COLONIES AND COUNTRIES IN WHICH DULY REGISTERED BRITISH GRADUATES AND DIPLOMATES CAN PRACTISE.

1. Without Compulsory Local Registration.

New South Wales, South Australia, Italy (only among visitors and aliens).

2. (*a*) After Local Registration.

Victoria, Tasmania, Queensland, New Zealand (£1, 5s. fee); Western Australia, Natal[1] (£1, 1s. to £3, 3s.); Cape Colony (£5 fee); Prince Edward Island ($20); New Brunswick ($1 to $2 a year); Nova Scotia, Quebec, Manitoba, North-West Territories ($50, and $1 to $2 a year); British Columbia, Jamaica, Klondyke ($50 fee); British Guiana, Fiji, Gold Coast, Gibraltar, Leeward and Virgin Islands, Monaco.

(*b*) After Application for Permission.

Belgium, Greece (examination in French or English); Italy.

3. Only after Examination.

State examination.—Austria, Denmark, Holland, Germany, Greece, Portugal, Roumania (*vivâ voce*), Russia, Norway, Spain, Sweden, Switzerland, Brazil (in French or Portuguese).

University or local examinations.—France, Turkey (£4, 10s. fee); Argentine (in Spanish); Chili (*vivâ voce*); Peru (*vivâ voce*); Uruguay (*vivâ voce*); Ontario.

4. America.

Twenty-four States require the passage of an examination; seventeen States require the same, or approval of the diploma presented by the applicant; and in nine, presentation of the diploma or degree is sufficient. The last nine are—

Alaska Territory, District of Columbia, Michigan, Arkansas, Kansas, Ohio, Arizona Territory, Nevada, Wyoming.

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[1] Annual licence also of £5.

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